



FRIDAY, APRIL 17.

The New Association of Western Railroads—President Ingalls' Address at the Chicago Meeting.

The leading part taken by Mr. M. E. Ingalls, President of the Cincinnati, Indianapolis, St. Louis & Chicago Company, in the meeting at Chicago, April 1, gives special interest to his speech on that occasion, which may be considered as setting forth the need of an organization distinct from the Joint Executive Committee, what it is hoped to effect by it, and the means to be employed. We give it below from the official report of the meeting:

To be serious about this matter, since I am to have my say at this time, and perhaps start something in the line of business in this meeting, I have been very much interested in getting this meeting called. It seemed to my mind as though something was absolutely necessary to be done to save the railroads of this country from utter ruin and destruction, and from the rates that were being made and the small margin of profit in doing the business. I am one of the people, perhaps they are few, who believe that the organization in the city of New York, in Mr. Fink's office, has outgrown its day of usefulness; that it has got vastly too large; and I want to say right here on the spot, that in any remark I may make I have nothing to say personally regarding Mr. Fink, and nothing to complain about personally. I believe he is a good man, who has given his time and talents honestly and faithfully to the railroads for the last few years, and he deserves our thanks for his services in the past. But I do not believe that the railroads from the Mississippi River to the Atlantic Ocean can be managed in New York city from the Broadway office. I believe that the result of the meetings and the conduct of that office in New York city have done pretty much what the temperance laws that have been enacted in some of our sister states have done; they have weakened the moral force of the people, and have been found a detriment in the end, and so I believe that the way in which the rates and tariffs and divisions have been fixed in Mr. Fink's New York office has weakened the effect of the General Freight Agent and the General Passenger Agent. It has accomplished undoubtedly great good; it has saved you millions of dollars, but you have got to change in this world, and at the present date you must change to meet the exigencies of the case. Now, if a trunk line pool, or something like it, can be continued and managed from Mr. Fink's New York office, and if we are left to shift for ourselves in the West, and can prepare something just as good, I believe we have solved the question, and I think the time has come to do that. This matter came up, as you will recollect, at a meeting in Indianapolis at which I was present, and it was thought it would be a good thing to get a meeting of the Western lines. The only question was whether the trunk line people who had lines entering the West were of the same opinion, and were willing to let the Western lines take care of themselves. I understand this matter was taken up and discussed at a trunk line meeting in New York city, and it was there agreed that the plan was worth trying, and that so far as the trunk line people could control their representatives West, they would have them represented at this meeting, and have them join in getting better rates and better times. The day on which the meeting is called, April 1, is perhaps a little ominous, but looking at the actions of the different railroads for the last few months, it seems an eminently proper day; and whether we can meet afterward on another day will depend very much on what we all do here to-day.

I have been a manager of a railroad for 15 years in this Western country, and never saw things in such bad shape as they are to-day. I have seen the through rate go down to 10 cents from Chicago to New York. I believe it is 15 cents to-day. But the difficulty is that some of the managers have claimed that on the basis of 20 cents there was a profit, and the result is that their short haul has been made on that basis. If there is a profit on 20 cents from Chicago to New York, that is 2 cents per 100 for every hundred miles; and heretofore for every hundred miles 6 cents was considered a low rate, and it has been a continual whittle down, until all your rates are made on that basis. You have got the further trouble, which perhaps you did not have in other times, and that is, your passenger rates are all gone to pieces. During the last few days an attempt has been made to restore them, but I understand the Cincinnati war is under full headway again, and you can buy tickets from there to New York for \$5, or indeed anything you have a mind to give. The only thing is for the man who purchases a ticket to make his own rate and he will get it. Added to all this is the loss of miscellaneous business and west-bound business which comes from the hard times. Now, these things all put together make it just about as hard for the railroads as it can very well be. Another thing which hurts, and that is the system by which the Pennsylvania Railroad makes rates, and which they believe is right. Whatever the tariff is from Chicago, that is the tariff along their whole line, reduced in proportion to the distance. Now, we had a tariff of 25 cents from Chicago to New York; some of us were unable to get local rates on that basis, and one of the roads becoming dissatisfied, new contracts were made at 20 cents, and the business goes at that. One of the lines becomes dissatisfied, I say, and asks Mr. Fink to reduce the rate to 20 cents, and it is immediately reduced. If an advance could be maintained with the same degree of unanimity, there would be no trouble in getting reasonable rates.

Another thing which endangers the road which I represent, and a thing which I think is hurting a good many of the Western roads, is that in New York, some two months ago, some of the roads had a little trouble with the Lackawanna. They found them cutting rates. They got together a meeting to reduce the through tariff to two-thirds of what it was on all west-bound business. That forces down your line from Cleveland, and our line from Cincinnati, and it affects Smith's line. It forces the entire rates of this western region down to two-thirds of what they were. And why are you being sacrificed? Simply because you are running your railroads on an iron-clad system, and the ukase goes out from Mr. Fink's office to the effect that rates must be reduced. Now, what is the remedy? I heard one gentleman say this morning, it is the survival of the fittest. It is just ten years ago that I met in this very room, with others, to try and restore rates. I think at that time there was present a railroad manager who thought he could operate his road and make money on a 25-cent tariff. The question was to get a 30-cent tariff, and the manager of a certain railroad then made a speech in which he declined to agree to a reduction of the rates, claiming that the matter must be fought out, and that it was a question of the survival of the fittest, and he, of course, thought he was the fittest. We have had ten years of that discussion, and to-day the

man who thought he was going to be the survivor of the fittest is hunting around hard to find ways and means to keep his road out of the hands of a receiver. To-day, if I wanted to fight, I would take the Wabash road, which my friend Smith represents, because they have nothing to pay except their operating expenses. If I wanted to take the weakest road, I would take Mr. Gray's line, because he has fixed charges which he must pay. If you cannot bring this down to the principle that railroad properties must be managed on different principles than ordinary business properties, then it is a failure, for certainly if you are in the boot and shoe business, and the man on the opposite side of the street undersells you, you might fight him and he might drive you out of business, but the moment you bankrupt a railroad, it is stronger than ever. In the mean time you are talking legislation so that you may make low rates. There is good reason to-day why you should get high rates. The times are not good. There is a great deal of trouble. Manufacturing are closing and employees are out of work. You have had one tremendous strike in this country, which resulted substantially, as I am informed, in a victory for the employees of a railroad. If you gentlemen are forced to try the plan of reducing the wages of employees, in order to keep out of the hands of the receiver, you know what the result will be. You are standing on a mine which is liable to explode at any moment, and you will have the times of 1877 over again, doubled and trebled in their violence, and every day that you keep these transportation interests in their present state, you defer the return to good times, because it is the great interest in this country, and on it almost everything depends. Now, is there a manager in this room who believes he can pay his men, and have good times again, on a rate of 15 cents from Chicago to New York? If there is, and he can prove it, he will have discovered a secret which I have been unable to find during the 15 years I have been managing a railroad.

There is another thing. I suppose all the gentlemen here and their friends could lose all the money they have invested in railroad enterprises and still live, enjoy themselves and not be troubled. I say there are some people who could lose every dollar they have which may be invested in railroad properties and yet could earn a good living and go through the world comfortably. We could stand that, but every man who is managing a railroad to-day has a character and reputation at stake which he cannot afford to sink; and if you cannot agree upon fair rates, if you cannot manage these properties and earn a fair income upon the investment; if you leave this meeting to-day, or a week from to-day, or a month from to-day, and admit that you cannot get good rates, you have made the business disgraceful, and the sooner each of us seeks some other business the sooner we will have peace and respectability. We will all be judged alike by the community and must all share alike, and if we cannot get good, fair paying rates, then we are all disgraced in my judgment. I believe that is the feeling of the business men of the community. It is all very well to criticize, but I think you all feel pretty nearly as I do in regard to this matter. The only question is, How can the change be made and what is the best thing to do? In other words, we must not tear down unless we are prepared to build up. I stated in opening that I believed the railways in Mr. Fink's office were too large; that there were too many of them there; that it had grown too large for control. Now, I believe we should organize an executive committee West; not in competition with the Eastern Committee, but to work in harmony with them. I do not know how some of the other managers of railroads find it, but I have always found it very difficult to have representatives at those meetings in New York. We hire our general freight and passenger agents to look after our business, and look after it ourselves; but if you have to go down to New York, and stay there a day or a few days or a week, it takes a good deal of valuable time, and I do not believe you can hold your rates unless you have a great many meetings. This is a big country, and the railroad interests are the largest industry in it. Let the trunk lines make their rates, and in time the West Shore and the Lackawanna will be in their trunk line pool; if not under this management, it will be under another. Let us take the railways from Buffalo, Salamanca, Pittsburgh, Parkersburg, the western termini of the trunk lines, and north of the Ohio River, and east of some certain line, and form another executive committee. Now, I don't believe we should go west of Chicago or west of the Mississippi River for that organization. Our friends who are here to-day and who are managing railroads west of Chicago, and west of the Mississippi River, have attended to their matters pretty well. The results by which they have to be tried show them to have been successful, but I believe if we should attempt to combine with them we should make a mistake, because their lines are so large.

We must remember that the railroads that stretch out into the west, 1,000 miles in length, are great interests. I do not believe that any pool in Chicago, any pool in Peoria, any pool in Indianapolis or any pool in St. Louis—however well made and however faithfully lived up to—will be just or succeed unless it is so enlarged as to include the outside business. Now, gentlemen, when you called me out, you alluded to Seneca, and right here is the proper place to say that at the meeting last November in New York city I was ready to pool all Seneca business. I was ready to leave it to any arbitrator or arbitrators to say what percentage we should have. I know I was backed by some of the trunk lines, and some thought it was better to close the line, which has been closed for three months, and now we are ready to take up the question again. I am willing to put the business from Seneca entirely in a fair pool made over these lines, and I am willing to leave it to any fair-minded man in case we are unable to agree. I believe that the Joliet business of the Michigan Central Railroad should be put into the pool, and I believe that the business at Streator, which goes over the roads there, should be put into the pool; and the next point I think is Peoria, and if you will extend that line to the Mississippi River you will have every junction point that has troubled you in a pool. Now, if you will make your Executive Committee of the lines of that territory, you will have about the same amount of business that is east or west of that line. You will have divided your territory, it seems to me, very well. The only line that would run across that territory and be in both of them, would be the Wabash, and we would have the Northwestern, the Milwaukee & St. Paul and the Chicago, Burlington & Quincy managing their own matters as they do, and I have no doubt they will co-operate with us in getting good rates and maintaining our association; for it is just as important to them that rates be maintained as it is to us. I tell you a war of rates is about as catching a disease as ever was seen. You gentlemen may think that you can make a barrier of the Mississippi and think that you can cut the rates there, but I tell you that it will creep beyond the Mississippi and will then go to the Rocky Mountains, and you will have to take hold of our hands to get good rates. There is no conflict between the lines. What shall we do? Practically, I believe that this meeting should establish a rate on the 20-cent basis; they should ask the trunk lines to co-operate with them and maintain their rate, and I believe that can be done for 30 days, at least until we have another meeting. I believe that the trunk lines should be asked to restore the nominal tariff from New York on west-bound business. They may make all the con-

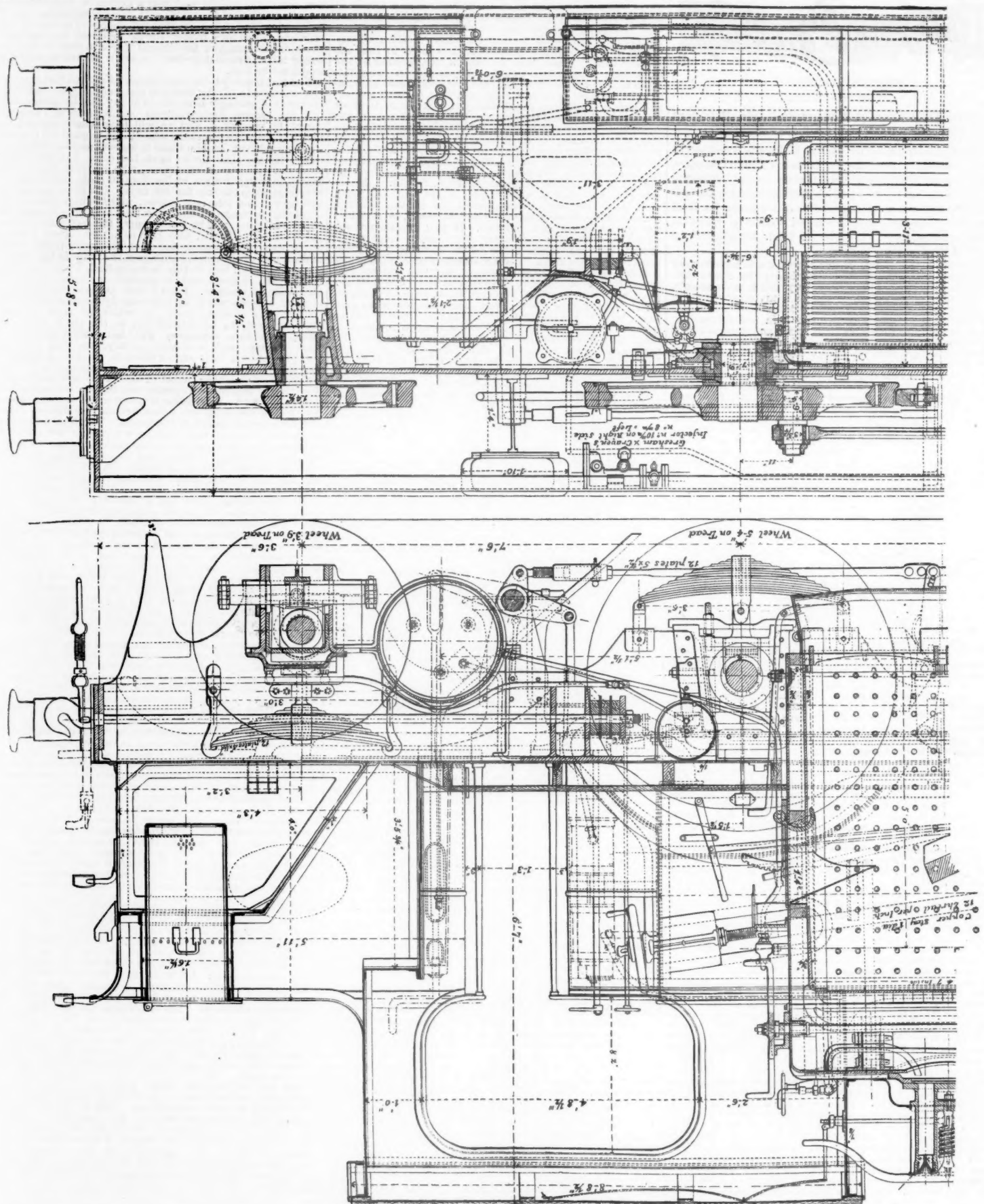
tracts they please, but I don't believe they have the right to take out of the middle railroads a million or more dollars a year on account of their fight with the Lackawanna, and if they will restore their rates that will enable us to restore our rates and make some money for the interests we represent. I believe the managers here should agree to restore the passenger tariff from to-day—but you say it cannot be done and would not be kept.

You had better let the past alone. You had better assert your manhood and say that you can control your railroads. If there is a manager here who will say that he cannot control his General Freight Agent or his General Passenger Agent, let him say so and we will have some sympathy for him. If there is a man here who cannot control his General Passenger Agent, let him make it known, and we will determine what we shall do to meet the case. I do not believe there is a man here in this room who believes there is any money in doing business at less than 20 cents, and if there is not, let us keep the rate for 30 days. It will be maintained and we will not lose any money, and I believe that the request that we make of the trunk lines to help us to maintain east-bound rates, will be used to carry this out, and I believe the Western roads will also help us in that. Then, I would go further, and either to-day or at some other time I would make a pool of the entire earnings of the roads in this middle states territory; but, if this is too radical, I would pool the entire traffic in grain and its product in this territory, and the passenger business. I am a firm believer that the time is going to come when the only remedy for railroads in this country is a clearing house, to which all their earnings shall be sent, to be divided out to the roads on a fair basis, and then managers will have time to look at their expenses and save their money, knowing they are going to get back their proper division. Is there a man here that knows or sees anything in sight in running his through trains. The passenger agent of one of the best railroads in this country told me two months ago that he did not believe that there was a single dollar of profit in his through trains. Now he is a wise man, and a man who deals in figures. Look at your heavy sleepers and fast trains. That is all expensive; but in addition to all that what are you doing? We are all of us paying the most enormous commissions in the world for selling our business. I think they had a meeting called the other day by Mr. Fink in Louisville. It was a reform meeting, and the reform asked was that the gentlemen should agree not to pay more than 15 per cent. of their receipts over to the ticket agents. But did it prevail? No, it was voted down. I consider this matter of paying commissions a fraud, and I am against any species of fraud. I would be willing to agree with the managers that we never pay another commission to an agent. In addition to that expense, look at the advertising bills you have to pay; look at the number of traveling men you have all over the country, and think of the bills you are paying for that one item alone; and whenever you have paid for all these things I have mentioned, if you have a credit on the balance side of your ledgers, you are very fortunate roads, and I say that knowing that I have as good a passenger business as anybody, and know what it costs. If we should pool all the passenger traffic in this middle states territory, see what we would save. You would save your traveling men, a large part of your advertising bills, and if you wished, you could wipe out commissions. This same proposition to abolish commissions was up ten years ago, and we could not get a manager for it. If you are afraid of your position, the commissions could be paid from the pool office of the territory, and in such amounts as the managers shall determine, and then I want to see how long managers will meet together and pay our commissions. It cannot be all done to-day, but it can be worked out by patience and forbearance. I have not had very much experience in that line, but we have a pool called the Chicago and Ohio River pool. It was made through the endeavors of Mr. Gray about 13 years ago, and that was my first experience in the matter. We have held together in one form or another for 12 years. We have enlarged it. And a year or two ago it was going to pieces because we had nine or ten roads, and everybody got frisky, because he thought he could make more by cutting rates than by staying in the pool. However, we got together, and the result was, we got an agreement, and to-day, amid all the wrecks and trouble that has been going on in this country, that pool has stood and dictated the rates in its territory for the last six months. It can be enlarged. You have all got pools on different things. If you can carry it out in a small way, what is the reason that we cannot take the territory west of the western termini of the trunk lines and north of the Ohio River, and make a pool that shall give us each a fair business and save expenses. If it takes us all summer to do this, there is no better way in which we could earn the salary paid us by our managers. Let us not have any talks over the mistakes of the past—they are plenty. We have had plenty of agreements that were not kept, I have no doubt—plenty that should have been kept. But out of them all has come some good, and there cannot be any good come out of breaking them up. We have the properties entrusted in our hands. More than that, as I said, we have our reputations and characters at stake. We have peculiar properties entrusted to our management, and to which the doctrine of ordinary business does not apply. There is but one way to manage it. You cannot buy and sell your rates. You have got to have an agreement, and the question is, what agreement; and I believe in time we can work this out. Now, in order to bring all this up to the proper basis, as this meeting is so large, and there is considerable to do to put the several matters I have mentioned in shape, I move that a committee of fifteen be appointed by the Chair, which committee will report the action this meeting should take, and that they report to this meeting at, say three o'clock this afternoon.

Legislation for the Protection of Railroad Investments—Speech of Gen. J. H. Devereux at the Chicago Meeting.

The proposition of General Devereux to set before the public the changes in the laws affecting railroad construction, of etc., which are needed for the proper protection investments in railroads, has attracted so much attention that our readers will be glad to know just what the proposer said in support of his resolution, which is given below as it appeared in the official report of the Chicago meeting:

I propose in a short talk to bring to your attention what has been to me a subject of the gravest consideration for a long period of time. I had hoped to have had the opportunity of introducing the matter before the sub-committee which you had appointed this morning. I did not want to bring up the subject fresh before even so intelligent a body of gentlemen as this is, and so well disposed to hear anything that was reasonable, until I was assured to some extent that the resolution that I shall presently offer would receive something of the favor of this meeting. It is one of that sort of resolutions which all experienced railroad men will agree to as being right in spirit, whether they will agree to it or not; just as human nature will agree that it is right to do the right and to abstain from the



LOCOMOTIVE FOR SUBURBAN PASSENGER TRAFFIC.

Great Eastern Railway, England.

Longitudinal Section and Plan of Rear End of Engine.

wrong, and yet keep on the wrong way, simply because it is the easiest and most pleasant thing to do. The opening remarks of Mr. Ingalls were impressive and important. They have not been lost sight of in the result of the meeting this afternoon, which is satisfactory, and although we may be just as earnest as we can be in the maintenance of the rates of this proposed tariff on the 6th of April, although this committee may go on and work diligently for the formation of a pool for the middle division, and although it may succeed in that measure and co-operate with the trunk line pool, still the cloud of doubt hangs over everything attending the work of the protection of the railroad interests, through railroad confederation.

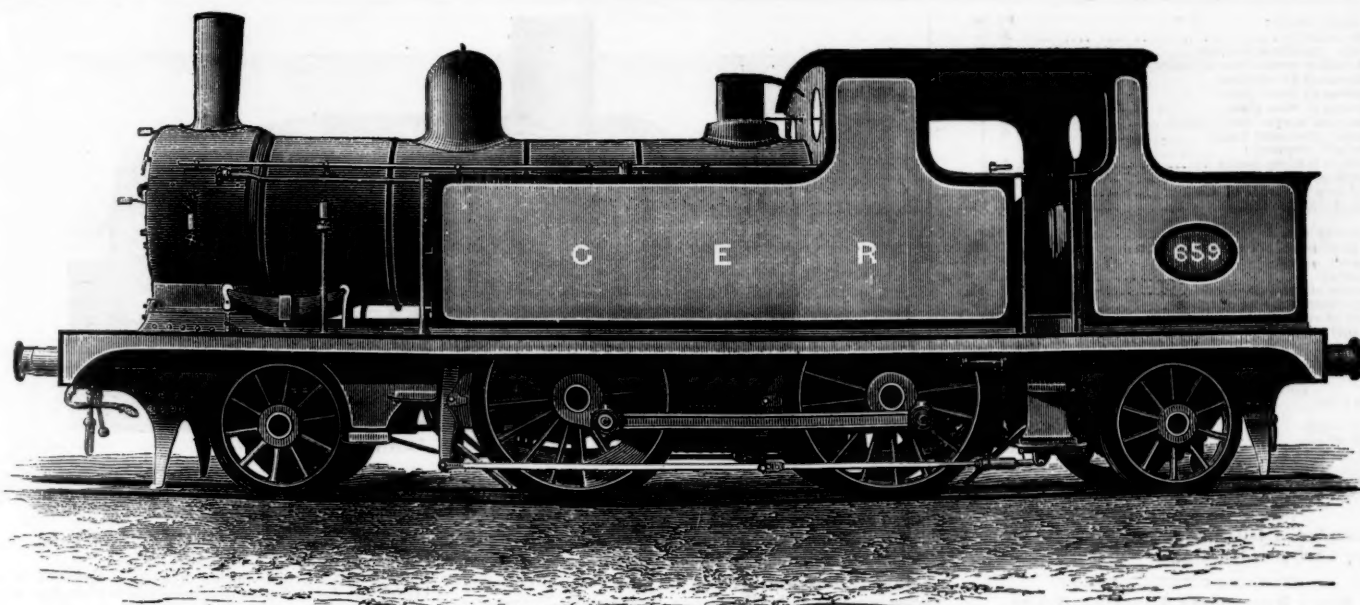
The very expression that Mr. Seargeant used in the committee room this afternoon, when the subject of the western pool was up, when he objected to the expression "pool," because it would not be pleasant to the public ear, and wanted it changed from "pool" to "division of traffic" illustrates it. And why? After all they are one and the same thing, and therein lies the root of the difficulty of to-day in carrying out our railroad agreements. There is nothing new about railroad pooling. As I said this afternoon, railroad men have come into the pools against their will. Railroad pooling began 17 years ago, and it only succeeded, if you can call it success,

within the last four years. Now, 14 years ago, in the darkness of the night, but lit by a lurid glare that seemed like the flames from hell, I went down this street as solitary and alone as if I was traversing the great desert of Sahara, and a pall of gloom hung over this now beautiful city, Chicago, which had in all her glory been wiped out by the fiery tongues of flame. The railroad men went to a meeting to meet Chicago's beaten-down but not disheartened business men, to consult over the situation, and it was grave enough. There was no mistake about the destruction and the loss, and there was no hesitation in the way railroad men went forward co-operating and helping the grand national sentiment and the grand national help and support that came to stricken Chicago. Chicago stands grand to-day, the grander for her trouble; but, gentlemen, in all earnestness, in all seriousness, I stand on this very spot now, and I see before me a far greater loss; not to Chicago particularly, but to this whole nation, in the destruction of railroad property in the last three years. Not only so, but looking forward, it is impossible to avoid the conviction that unless this thing is stopped there is no other thing but absolute sacrifice of every interest which you and I represent. There is nothing to prevent it. You may call it bankruptcy, or hard times, or what you will, but that is not it; it is the working of natural laws. The troubles that we face to-day are more than

we can handle successfully alone, without any compact or agreement for the maintenance of rates. The time is coming when the railroad men must stand on their feet, as my friend McMullin stood up before the Board of Commissioners two months ago, and stated what the truth was, that railroad men and railroad managers were not demons bounding the public, but that railroad men were working for the public good, and were managing their interests in a business-like way. That is the idea underlying this thing, and here is the trouble to-day. I hold in my hand the proceedings of the presidents' meeting of the trunk lines held on the 16th of January, 1885, and how is it? Here is the resolution:

"Resolved, That the trunk line companies, with their affiliated western connections, represented at this conference, will, as regards competitive through freight traffic, refuse to exchange any such traffic with their eastern or western connections upon which the agreed established rates are not maintained. Nor will we permit our lines to in any way be a part of a route upon which through traffic is carried at less than the full, agreed established rates in respect of such through freight traffic."

Now, unless such a resolution as that can stand, what becomes of the pool? If we cannot enforce our agreements, what is to become of us? There is the difficulty



LOCOMOTIVE FOR SUBURBAN PASSENGER TRAFFIC.
Great Eastern Railway, England.

I might go on and read extracts from these, I might read extracts from Mr. Seargeant's remarks as to what he could not do, and so on and so on, and that resolution was repealed. Now, then, what is that? I have great respect for the law, and no man more so. A man cannot do more than risk his life for the maintenance of law, and that is what I have done. I cannot give any greater proof of it than that; but Judge Baxter's decision was not law, after all. It was left in such a shape that it produced the worst possible effects, and nothing is decided. Judge Baxter was probably honest. Here was a receiver, and the road said to him, we cannot get our business off. He did not know that in stating that he laid a little fire that would burn from the lakes to the Atlantic seaboard, burning up millions of property. No, that thing ought to have gone to Washington.

What we have got to do, and I don't know that you will agree with me on the resolutions, but I think the time is coming for it, though; I think we have to have the people understand what the facts are. To get rid of this demagogism about the management of railroads, to submit ourselves to inspection, and be glad to have the law-makers and the railroad commissioners come around and see why we do it, how we do it, and what we do it for. We have also to have the people understand that one-seventh of the entire wealth of the United States is invested in railroad property; that nearly 75 per cent., at least 50 per cent., of the labor of the United States is employed upon the railroads, or in their mills and shops, furnishing supplies for the roads, and five hundred millions of dollars are spent annually by the roads for labor. Mr. Ingalls was speaking about the strike in the West, and the inability of the roads to pay their men. Why, we cannot pay anything in this country if we go on in that way. Now what are we going to do? These men should be made to understand why they cannot get their money. Who has more interest in the maintenance of railroad property, after all, than the laboring men? That must be brought before them in a proper manner and in the right way. There is only one way, and without making a long argument over it, feeling deeply as I do about it, and that it is concentrated in the following resolution, which I will read:

"Whereas, The representatives of the railroads of the states of Illinois, Michigan, Indiana, Ohio, Pennsylvania and New York, as represented at this meeting, being moved by a deep sense of the responsibilities attached to them as public servants in the discharge of corporate trusts, and believing that the time has arrived when public criticism and public scrutiny should be specially invoked for a thorough consideration of the causes of financial loss which have attended the operation of railroad property, to the end that rightful action and co-operation shall and may be secured and established in respect of the true relations, conditions and responsibilities of railroads as to the commonwealths and nation; therefore, be it

"Resolved, That a committee be organized and appointed, which may consist of seven or more skilled and experienced men, who shall carefully consider the existing laws governing, and the practice obtaining in, railroad construction and operation; that whatever change, alteration and protection, under law, is found to be reasonable and requisite, the same shall be set forth in prepared argument, together with all facts of the situation; that thus prepared, on or before the 4th day of July next, the committee shall call a convention, to meet at the city of Philadelphia, inviting thereto, by special and particular notice and invitations in advance, the Railroad Commissioners of the several states, the transportation committees of Congress, including the Chief of the Bureau of Statistics, representatives of the commercial interests of the cities of Boston, New York, Philadelphia, Baltimore, Chicago, St. Louis, Cincinnati and other western cities between the Mississippi Valley and the seaboard, together with representatives of American labor and manufactures; that the facts as found by the committee, and their report and recommendation, be there submitted, considered and discussed, and the result thereof be given the widest publicity for the consideration and action of the people.

"Resolved, That this plan be recommended as the sense of this meeting, to the principal eastern roads, and the trunk lines are respectfully urged to move in and direct the matter, receiving our co-operation therein."

Now, that may seem to be the Pope's bull against the comet, but something has to be done, and this seems to be the only way to start, in my judgment.

In the first place, a great many horses have been stolen out of the barn, and it is pretty nearly empty in regard to railroad construction. The people cry out against railroad monopolies, and yet they leave the eminent domain to Tom, Dick and Harry, and then they give them a charter and they build a road, and generally build it where they think it can do the most good—in other words the most harm; not to carry freight, but as one of them stated to me, "not to carry freight, but bonds." And they don't carry anything else. They do not earn interest. The laws of the different states vary in regard to the rights of building roads, and it is right that no road hereafter shall be built on any bonds at all, other than debenture bonds; that the road should be built by fully paid up capital stock, that whatever bonds are

given to it shall be debenture bonds. It is simply right, that no road shall be built except subject to the approval of some competent tribunal. That would clear the way of the future for some time to come. That would be reasonable.

In regard to rates, there is a great stir about them. It is a great subject. I think that after rates are made, they should be held by law rigidly for a certain length of time, and that they should only be changed by public notice, and that the change of rates should be open to the Commissioners. And the result is—the idea would be—that this committee would be able to present and adjust a clear statement of what the existing evils were; what they brought us to, and would give something tangible and something that could be worked on to go to the Legislature and get the right sort of law in regard to protection. That has got to come sometime, it seems to me, and we might as well make an effort for it now. I offer this resolution now, Mr. Chairman.

Before the resolution was put Mr. Ingalls said: I have listened with a great deal of pleasure to the remarks of Mr. Devereux. It is very broad and on the right line, and it is only a question with me whether we would not get hold of something that would bother us a good deal to let go of, but I would suggest that the resolutions be printed, and a copy sent to each railroad manager and commissioner in the country, and that the resolutions be brought up for the consideration of the next meeting of the committee.

Under the plan we have started to-day, you have a committee of fifteen who have to get up a plan of pooling. Now, if these resolutions can be printed, it will give us time to think them over, and they will be sent to all the managers, and then we can consider them at our next meeting. And I now offer that motion, that the resolution as offered be printed and a copy sent to each railroad commissioner in the country, and that they be taken up for consideration at the next meeting of this general committee.

This motion was adopted by the meeting.

English Locomotive for Suburban Passenger Traffic.

The accompanying illustrations represent the external appearance and arrangement of rear end of a class of locomotives built by an English company, the Great Eastern Railway, to work its heavy short-journey passenger traffic in the eastern part of London. This company possesses quite a network of metropolitan lines, most of which are situated in densely populated districts. The two termini (Liverpool street and Fenchurch street, both situated in the heart of the city), are among the busiest stations in the world, the former being the largest in London, and having over 700 passenger trains in and out during the 24 hours. In addition, this company possesses 44 passenger and 28 freight stations inside the boundaries of London. Most of the line is constructed on brick viaducts or embankments, or in open cuts. A few short tunnels are used, but the line in general is some 20 ft. above the ground, and though a few highways are crossed at a level in one of the extreme suburbs, the streets are generally crossed by plate girder bridges, arranged with galvanized iron screens so that horses cannot see the trains and are therefore less liable to be frightened.

Parts of this network were built over forty years ago, when the locomotives in use were even lighter than those on the Manhattan, but fortunately bridge and viaducts were then designed with an ample margin of strength, and have required little alteration to carry far heavier loads than were originally contemplated.

The steepest grade is about 75 feet to the mile, and the sharpest curve is about 9 degrees. On one service the distance to be traversed is 10½ miles, with 15 stopping stations, the time allowed for the journey being 41 minutes. This corresponds to a speed of 15.7 miles an hour, including stoppages, which is a very good speed considering the short distance apart of the stations.

The trains seat from 600 to 900 passengers, and are composed of from 14 to 20 four-wheeled vehicles, each weighing about 20,000 pounds. The consumption of coal in working the former train is about 30 pounds per train-mile.

While experience here has been decidedly in favor of the Forney as opposed to the double-ender type of engine, Mr. T. W. Worsell, the Locomotive Superintendent of the Great Eastern, has gone back to the double-ender type, which many years ago was superseded in England by the Forney type of

engine. The four-wheeled truck with sliding lateral motion controlled by horizontal rubber springs has been for years the device in most general use in England for giving lateral motion,* but in this engine, a single pair of wheels at each end, and radial axle boxes controlled by elliptic springs enable engines to traverse curves.

The screw reversing gear shown has been used for many years and on all classes of engines. It is of a somewhat different type to that shown in our recent illustration (March 27, 1885), of a Mogul engine for New South Wales built by the Baldwin Locomotive Works.

Among the special features of these engines are the following: The copper fire-box roof is supported by eight cast-steel roof bars of a girder section; the wheels are of cast steel; the frames are made each of a single steel plate, 1 in. thick, as are also the buffer and cross stay plates in front of the fire-box; the motion plate and the trailing diagonal stay are both steel castings, the latter being arranged so as to take the draw-bar, and also to give additional weight at the trailing end.

The engines are fitted with the Westinghouse brake, the air pump for which is conveniently placed in a box at the back of the tank on the left-hand side, so as to be within easy reach of the engineer; the air reservoirs are fixed under the platform at the trailing end of the engine. The boiler is fed by two fixed nozzle non-lifting injectors, one No. 8 and one No. 10, fixed on each side of the engine, underneath the tanks. The handles of the injector cocks are conveniently situated, and can be got at readily by both engineer and fireman.

We are indebted to the *Engineer* for our illustrations of these engines, and for the following tabular list of dimensions:

	Ft.	In.
Cylinders:		
Diameter of cylinder	1	6
Stroke	2	0
Length of ports	0	11¾
Width of steam ports	0	1¾
Width of exhaust ports	0	4½
Distance apart of cylinders centre to centre	2	0
Distance of centre line of cylinders to valve face	1	1
Distance of centres of valve spindles	2	0
Lap of slide valve	0	1½
Maximum travel of valve	0	5
Lead of slide valve	0	0-13-16
Diameter of piston-rod (steel)	0	3
Length of slide-blocks	1	3
Length of connecting rod between centres	5	11
Wheels and axles:		
Diameter of drivers on tread (cast steel)	5	4
Diameter of front and hind wheels (cast steel)	3	9
Distance from centre of leading to centre of driving	7	6
Distance from centre of driving to centre of hind-driving	8	0
Distance from centre of hind-driving to centre of trailing	7	6
Distance from driving to front of fire-box	1	10
Distance from leading to front of buffer plate	5	3
Distance from trailing to back of buffer plate	3	6
Driving axles:		
Diameter at wheel seat	0	8¼
Diameter at bearings	0	7
Diameter at centre	0	6¾
Distance between centres of bearings	3	10
Length of wheel seat	0	7¼
Length of bearing	0	9
Section of crank arms: inner web, 12 in. × 4¾ in.; outer, 12 in. × 4¼ in.		
Diameter of outside crank pins	0	3¾
Length of outside crank pins	0	4
Throw of outside crank pins	0	11
Front and hind axles:		
Diameter at wheel seat	0	8
Diameter at bearings	0	6¼
Diameter at centre	0	6
Length of wheel seat	0	6¾
Length of bearing	0	11
Centres of bearings	3	8
Thickness of all tires on the tread	0	5
Width of all tires on the tread	0	5½
Frames:		
Distance apart of main frames	4	0
Thickness of frame (steel)	0	1
Boiler:		
Centre of boiler from rails	7	3¼
Length of barrel	10	2¾
Diameter of boiler outside	0	7
Thickness of plates (steel)	0	0-7-16
Thickness of smoke-box tube plate	0	0¾
Lap of plates	0	2¼
Pitch of rivets	0	1-13-16
Diameter of rivets	0	0-13-16

*Illustrations of this form of truck, "Adam's Bogie" will be found in *Recent Locomotives*, and in the issue of the *Railroad Gazette* for Aug. 20, 1880, page 458.

Fire-box shell (steel):	Ft. in.
Length outside.....	5 5
Breadth outside at bottom.....	3 11
Depth below centre line of boiler.....	5 0
Thickness of front plate.....	0 0 1/2
Thickness of back plate.....	0 0 1/2
Thickness of side plate.....	0 0 1/2
Distance of copper stays apart.....	0 4
Diameter of copper stays.....	0 1
Inside fire-box (copper):	
Length at bottom inside.....	4 9
Breadth at bottom inside.....	3 3
Top of box to inside of shell.....	1 4
Depth of box inside.....	5 8 1/2
Tubes:	
Number of tubes.....	198
Length of tubes between tube plates.....	10 0 1/2
Diameter outside.....	0 1 1/2
Thickness.....	Nos. 11 and 13 1/2 g.
Diameter of exhaust nozzle.....	0 4 1/2
Height from top row of tubes.....	0 2
Height of chimney from rail.....	12 11
Heating surface:	
Of tubes.....	855.7
Of fire-box.....	98.4
Total.....	1054.1
Grate area.....	15.43 sq. ft.
Weight of engine:	Working order. Emptv.
Front wheels.....	28,700 lbs. 25,088 lbs.
Main drivers.....	35,056 " 29,876 "
Hind drivers.....	30,212 " 25,258 "
Hind wheels.....	22,316 " 15,160 "
Total.....	116,284 lbs. 95,382 lbs.

The tanks hold 1,440 gallons of water, and the coal bunkers will carry 5,600 pounds of coal.

Hall's Subaqueous Tunneling Device.

Subaqueous tunneling has always been, and to some extent, no doubt, will always continue to be a costly, tedious and dangerous operation. The interested reader will find in Mr. Drinker's elaborate and invaluable treatise on tunneling a summary of pretty much all that had been done in that line up to the date of its publication, which consisted (1) of the old Thames tunnel, built at a cost of \$2,000 per lineal foot; (2) of the new (8 ft. diameter) Thames tunnel; (3) the Detroit River tunnel, abandoned after some 1,300 ft. had been driven, not indeed as impossible, but as too expensive, owing to the treacherous nature of the soil; (4) the Chicago street tunnels, built of brick in open cut, protected by coffer dam; (5) four lake tunnels for water supply, driven through clay and rock; (6) the Hudson River tunnel, still uncompleted, and recently described in a monograph by S. D. V. Burr; (7) the great Channel tunnel, to be driven through chalk, and for which a most ingenious and effective machine was devised; the abandonment, or (it is to be hoped) merely delay in construction, being due only to political causes.

To this list is to be added the great tunnel under the Mersey at Liverpool and the new Severn tunnel, both driven through rock and involving interesting and meritorious engineering details, but no radical "new departure."

This short list, with a few others of a minor character for water-pipe, etc., includes all the subaqueous tunnels which there are in the world, a fact which alone reveals the difficulties involved, for the localities where such tunnels would be desirable if not too expensive are very numerous, as notably in harbors like New York or under large navigable rivers.

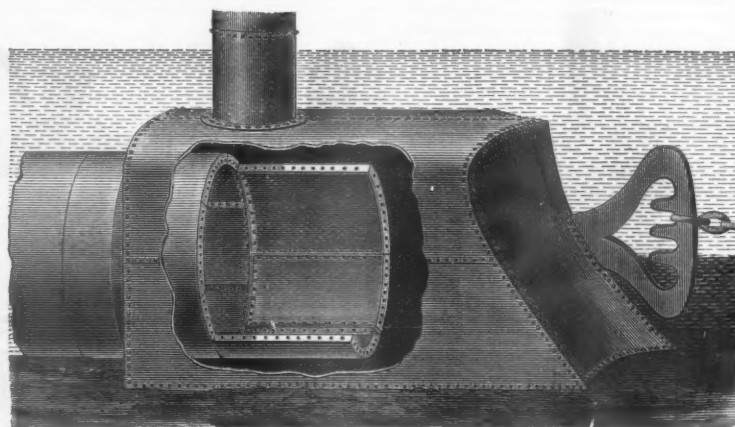
A most interesting study of a floating channel tunnel to be built of metal, was made many years ago by the late Zerah Colburn (we presume) and published in *Engineering*. All the subaqueous tunnels so far constructed, however, have been driven under the bed of the channel in the ordinary manner, or as near to the ordinary manner as circumstances permitted.

The plan devised by Mr. Hayden H. Hall, and illustrated in outline herewith, differs, so far as we know, from all the methods which have heretofore been employed, and seems to possess certain features of merit and interest. The plan has been tried with, it is stated, perfect success, in laying large water pipes, but has not been as yet applied to tunneling for railroad purposes, so that, in advance of actual construction, for which, we are informed, negotiations are now in progress, the details of its application to such purposes cannot be considered as fully perfected. The device is so simple in principle, however, that its extension to larger tubes than have heretofore been laid seems to be a feasible extension of the method, which is in detail as follows:

The tunnel is constructed of, say 18 ft. diameter, of heavy sections of chilled white cast-iron, 3 in. or more thick, which can be cast, it is said, directly from the cupola, without remelting, and furnished at the present time at about \$14 per ton, ready for use, which would make the cost of the iron in the tunnel about \$42 per lineal foot. Such metal is said to be non-corrosive in sea-water, pieces having been exposed for 12 years in Sydney harbor, Australia, without injury. The sections are bolted together by inside flanges so as to present a smooth exterior.

The plow-shaped caisson shown has a stuffing-box at its back end, precisely like the piston stuffing-box of an engine in principle, making a water-tight joint around the tunnel tube. Starting from one shore, a few sections of the tunnel are fitted together and the stuffing box put in place. An additional section is then put together inside the caisson, with water-tight rust joints, and the caisson is then moved ahead one length by means of the clevis in front, by hydraulic power or otherwise, until a sufficient number of sections have been put together to afford the necessary stability, when from 2 to 6 hydraulic jacks inside the caisson may be used, if found more convenient. The caisson is loaded with lead or iron to overcome its buoyancy (which is of course great); and by varying the pressure on the jacks, or the position of the loading, or both, the prow can be guided up or down or from side to side. If a vertical or lateral curve in the tunnel be desired, the sections are cast to produce it. Otherwise, it is too large to permit of even slight deflection.

A connection with the surface by the vertical shaft shown



HALL'S SUBAQUEOUS TUNNELING CAISSON

may or may not be maintained. It has been used (of about 5 ft. diameter) in laying 4-ft. water pipe, to lower the successive sections of the pipe through, the sections being 10 ft. long. If the tube be built in sections, as shown in the engraving, there is no necessity for this, direct and open connection with the shore being always maintained. No compressed air is used except to work a small pump by which the leakage (which has not heretofore been a serious consideration) is removed.

When the depth of water is sufficient to permit of the obstruction to the channel the tunnel is laid directly on the surface, otherwise a channel is dredged ahead of the tunnel very nearly to the depth required, leaving to the plow-shaped caisson to complete the work. If the bottom be stratified rock the grade of the tunnel is so far as possible adapted to follow the stratifications; the pipes already laid by this method were successfully carried over rock in this manner. Otherwise, rock or boulders are removed by submarine blasting, conducted from the surface in advance of the caisson, and a sand or earth filling added to smooth off the bottom and afford an even bearing. In depths not exceeding that convenient for divers subaqueous work of this kind is comparatively inexpensive, and it is not now contemplated to apply this method to greater depths than 60 or 65 ft. The tubes already laid were in 45 ft. of water under a channel 1,230 ft. wide. These tubes were laid by Mr. Hall in the harbor of Sydney, Australia, with, he states, perfect success; the caisson used having been a provisional affair, built of wood and 3-in. angle iron, 16 ft. long by 12 ft. wide by 10 ft. high. It was used for laying two pipes at once, having a gross buoyancy of about 62 tons, counteracted by loading.

Assuming a tube 18 ft. in external diameter and 3 in. thick, the weights and buoyancy of such a tunnel would be as follows:

Weight of iron, @ 480 lbs. per cu. ft. (with flanges) say.....	Lbs. per lin. ft. 6,800
Buoyancy, in sea water weighing 64 lbs. per cu. ft.....	16,288
Excess of buoyancy of tube, to be counteracted by loading.....	9,488
An 8 in. lining of brick would weigh about.....	4,450

A 16-in. lining of brick, with the rails, ties and ballast, would leave it an easy matter to add any necessary additional loading within the tube without obstruction. A circle 15 ft. in diameter or a clear rectangle above the rails 14 ft. 6 in. by 11 ft. will pass the largest parlor cars.

The advantages of this device over ordinary methods are that it brings the grade much higher than any tunnel through the solid, especially in treacherous material; that all excavation is done from the surface by dredging or other controllable and comparatively cheap methods; that no compressed air is used, but there is always an open connection with the land and (if desired) surface, and that the protection against inroads of water is always positive, not depending upon treacherous natural material or internal air-pressure. The chief disadvantage would seem to be that great delicacy and care are necessary for handling the caisson, as any sudden or irregular pressure, arising, for instance, from the failure to act of some of the jacks and not the others, might be disastrous. The caisson is represented in the engraving with a flat bottom, as that was the form used, but no special reason is apparent why it may not be rounded on the bottom, substantially to the form of the tube, thus reducing the amount of dredging required.

Master Mechanics' Association Circulars.

The following circulars of inquiry from committees have been sent out by Secretary J. H. Setchel from his office in Cincinnati:

HYDRAULIC BOILER TESTS.

Your Committee on Hydraulic Boiler Tests solicit answers to following questions:

1. Is the frequent testing of boilers by hydraulic pressure desirable? If so, how often should these tests be made? What excess over working pressure should be applied, and why?
2. Do you recommend other tests in connection with hydraulic? If so, what other tests, and why?
3. Do you consider the test of a locomotive boiler at rest by hydraulic pressure conclusive to its safety under all conditions of service?
4. Please give any information you may have on this subject not called for in the foregoing questions.

Replies to be sent to H. N. Sprague, Pittsburgh, Pa.

H. N. SPRAGUE,
W. L. HOFFECKER, } Committee.
D. O. SHAVER,

LOCOMOTIVE VALVE GEAR.

1. Have any improvements in Locomotive Valve Gear

come under your notice? If so, name them, and, if possible, explain by sketch, tracing, etc.

2. Are such improvements patented?

3. What advantages are to be gained by the use of such improvements?

4. If a better distribution of steam is obtained, please illustrate this by indicator diagrams taken from an engine fitted with such improvements, as compared with others taken from an engine not so equipped.

5. How does the cost of construction of such gear compare with that of the ordinary gear? Please give figures obtained from actual practice.

6. Please illustrate, by figures obtained from actual practice, the difference in cost of maintaining such improved gear, as compared with the ordinary gear.

7. Have any improvements in the details of the ordinary link motion come under your notice? If so, please describe the same, and if possible explain by sketch or drawing.

8. Are such improvements patented?

9. What advantages are to be gained thereby?

10. If you can give any information bearing on this subject, and not covered by foregoing questions, you are respectfully requested to furnish the same.

CHARLES BLACKWELL,
JOHN F. DEVINE, } Committee.
M. M. PENDLETON,

SMOKE STACKS AND SPARK ARRESTERS.

Your committee on smoke stacks and spark arresters respectfully requests replies to the following questions:

1. What form of smoke stacks do you use in connection with the ordinary smoke arch? Please give dimensions and results obtained.

2. Are you using any form of spark arresters or extension front ends? If so, state how constructed and results obtained.

3. What has been your experience with the fire brick arch or other device in the fire box in connection with the extension front as compared with the ordinary smoke arch?

The committee desires to make as full and complete a report as possible, and earnestly requests the members to give us, as early as convenient, any information bearing on the subject, not confining themselves entirely to the questions propounded above, but giving any information obtainable in addition to that requested.

It is also desirable that drawings or sketches giving dimensions of the various devices be furnished with your report.

Please send replies to W. F. Turrett, General Master Mechanic, Cleveland, Columbus, Cincinnati & Indianapolis Railway, Cleveland, O.

W. F. TURRETT,
GEO. B. ROSS, } Committee.
W. T. SMITH,

STEEL CASTINGS FOR LOCOMOTIVES.

Your Committee on Steel Castings for Locomotive Work respectfully solicits replies to the following questions:

1. Have you had any experience with steel castings for locomotive work? If so, please say to what extent.

2. Do you believe steel castings can be used satisfactorily as a substitute for iron?

3. Does your experience with steel castings lead you to believe that the material is reliable under all circumstances?

4. What parts of a locomotive do you consider steel castings best adapted for?

5. Taking into consideration the first cost of steel castings, how does the service got from them compare in cost with the service got from iron?

The committee will gladly receive any additional information on the above subject you may have to communicate.

R. W. BUSHNELL,
JOHN BLACK, } Committee.
T. J. HATSWELL,

Replies should be sent as early as possible to R. W. Bushnell, Chairman of Committee, Master Mechanic Burlington, Cedar Rapids & Northern Railway, Cedar Rapids, Iowa.

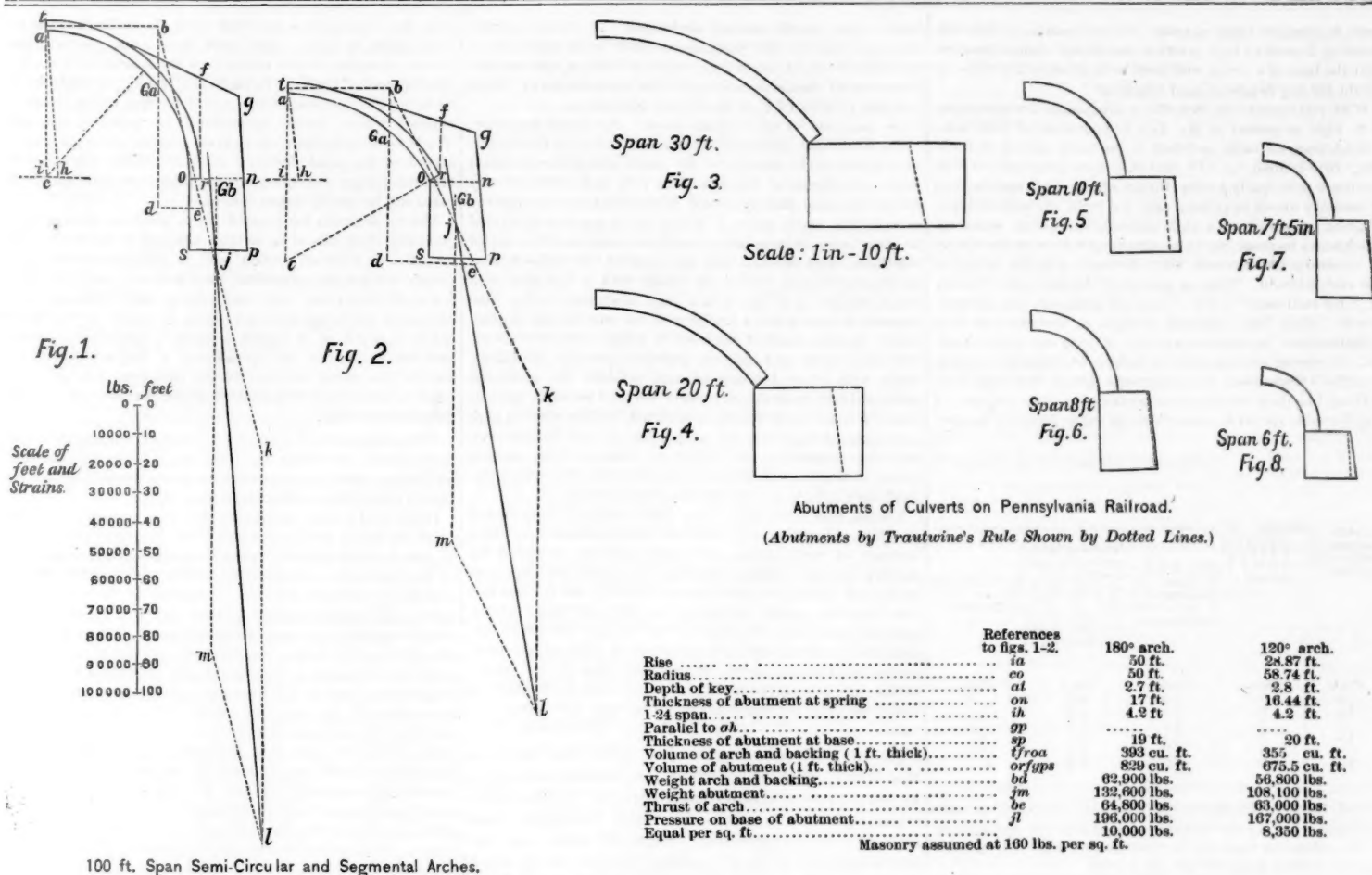
Contributions.

The Locomotives "Decapod" and "El Gobernador."

SACRAMENTO, April 4, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your paper of March 27 I see an article headed "The Locomotive Decapod," under which is given a comparison of the weights, etc., of the engine "Decapod," with the engine "El Gobernador," of the Southern Pacific Railroad. You have not stated correctly the weights of "El Gobernador" and the capacity of her tank. The first figures, stating weight of engine, capacity of tender, etc., etc., were estimated while the engine was under process of construction. The actual weight of "El Gobernador," in working order, is 154,000 lbs.; weight on driving wheels, 121,600 lbs.; weight of tender empty, 32,000 lbs.; capacity of tender, 3,000 gallons of water; the coal usually taken aboard is 10,000 lbs., though 15,000 can, if necessary, be put upon the tender. "El Gobernador," has not six-wheel tender trucks but has ordinary four-wheel trucks. The article also says, "The great difference in the two engines is in the size of the wheels; the 'Decapod's' wheels are made as small as possible in proportion to the stroke of piston; consequently, the saving of weight effected by the smaller wheels and shorter cylinders enables the boiler to be increased to the unprecedented size of



64 in. in diameter. The smaller wheels also enable a shorter driving wheel base to be adopted, the large wheels on "El Gobernador" nearly touching one another, though the wheel base is very long."

The driving wheel base of "El Gobernador" is 31½ in. more than the "Decapod's," and the wheels are as small as they can be in proportion to the stroke. "El Gobernador's" boiler is 62 in. in diameter in the largest course and 56½ in. in the smallest; it contains 178 2¼-in. tubes, 12 ft. long.

A. J. STEVENS, Gen. M. M. Central Pacific Railroad.

[As we gave the weights of the engine within less than 1 per cent. of Mr. Stevens' figures, the only essential correction in the above letter on our figures is in the weight of the tender of "El Gobernador." As illustrated and described in our columns Jan. 18, 1884, the tender was carried on two six-wheeled trucks, and weighed 50,650 lbs. when empty. Apparently a lighter tender on four-wheeled trucks has since been substituted.—EDITOR RAILROAD GAZETTE.]

Trautwine's Rule for Thickness of Abutments of Arches for Bridges and Culverts.

No. 1,927 BROWN STREET, PHILADELPHIA, Feb. 21, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your editorial of Jan. 23, on "Culverts," escaped my notice until a few days ago; but I trust it is still not too late to reply to your very generous criticism of my father's rule for the thicknesses of abutments of arches for bridges and culverts.

At first sight it would certainly seem, as you remark, that, in arches of 100 ft. span, with abutments 25 ft. high, "it can hardly be right that the thickness of the abutment on top should be, with the semi-circular, 17 ft., and with a segmental of 120 degrees, only 16.45 ft." It is natural to assume that either the abutment of the segmental arch is too light to be safe against the arch-thrust, which is here the controlling factor, or that the abutment of the semi-circular arch is too heavy, "or both."

But I think it will appear, from a comparison of the inclosed drawings (figs. 1 and 2) of these two arches, with their abutments by the rule, that this assumption is incorrect, and that the thrust of the arch and the load upon the structure are fully, and about equally, provided for in both cases.

In the segmental arch, the resultant of all the pressures on the base of the abutment cuts, said (20 ft. wide) base within 6 in. of its centre, and forms an angle of less than 10 degrees with the vertical; and the pressure on the base is less than 4 tons per sq. ft. The abutment is, therefore, abundantly safe, notwithstanding that the arch-thrust is more nearly horizontal and the weight of the abutment less than in the semi-circular; because (first) the amount of the arch-thrust is a little less; (second) the abutment, although 6 in. narrower on top, is a foot wider at base, and (third) the resultant in fig. 1 cuts the base well on the inner half of its width, so that, although the resultant in fig. 2 is nearly 1½ ft. nearer the back of the base, it is even nearer to its centre than in fig. 1, but on the opposite side from it.

In fig. 1 the resultant cuts the 19 ft. base within a foot of its centre, forms an angle of 5 degrees with the vertical, and

amounts to 4½ tons per square foot. While, therefore, it is still abundantly safe, it cannot be called excessive, especially in view of its more severe duty as a retaining wall, which must here be taken into account; for while, as you say, in an arch of 100 ft. span "any pressure from earth backing sinks into insignificance compared with the thrust of the arch," yet the proportion between said earth pressure in a semi-circular arch and that in a given segment is much greater in a 100 ft. span with roadway but a little above the crown, than in a 10 ft. culvert under a high embankment. Besides, the bulging tendency of the earth is, in any case, but little diminished by the arch pressure, however great.

I have drawn the bridges without loads, but the direction and amount of the resultant in such a bridge would not be materially changed by any train that could come upon it, while the weight of spandrel filling and roadway would greatly increase the stability of the abutment.

But while our formula, page 348, thus gives practically the same top thickness of abutment for any arch of a given span, for central angles between 180° and about 120°, provided the height of the abutment does not exceed 1½ times the base obtained by the rule, yet for flatter arches it gives greater top thicknesses than for semi-circles; and the further directions given in the rule provide much greater base thicknesses, owing to the sharp batter which they then give to the backs of the abutments.

Noting your statement that our rule gives "somewhat lighter abutments for small structures than average practice approves," I venture to ask whether you have not hastily assumed (from the fact of its being a "single general formula for two distinct classes of abutments"), that it gives similar sections for the abutments of said two classes, and whether you have not overlooked the effect of the constant additive quantity of 2 ft., which, of course, gives proportionally thicker abutments "for small structures."

The following is a comparison between the abutments of six culverts of the Pennsylvania Railroad and their dimensions by our rule. Figs. 3 to 8 show the comparison graphically.

Span.	Rise.	Radius.	Height of abutment.	Thickness of abutment.			
				At springs.		At base.	
				Penna. R. R.	Trautwine.	Penna. R. R.	Trautwine.
Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
30	6.75	20	5.25	10	6.7	10	7.7
20	5	12.5	5.5	7	5	7	5.9
10	5	5	5	4.5	3.5	4.8	3.9
8	4	4	5	3.2	3.2	3.7	3.6
7.5	3.75	3.75	5	3.2	3.1	3.3	3.5
6	3	3	3	3	2.9	3.25	3

The actual thicknesses for the "small structures" are practically identical with those given by our rule. The only considerable differences between the company's dimensions and ours are in the larger spans. In these, and indeed in all of them, the company's thicknesses are admittedly heavier than required for entire safety, and are therefore probably heavier than "average practice." They are so made on the principle that it is true economy to spend a few hundred dollars in masonry to give super-abundant strength to a costly structure, over which the heaviest of the company's exceptionally

heavy engines run at their highest speeds, and any repairs to which would be peculiarly troublesome and expensive; or, as remarked by Mr. Brown, the Chief Engineer, in your words, because "we take no chances."

Their great thicknesses can hardly be given, as would follow from one of your suggestions, with reference to their duty as retaining walls; for the proportion of thickness to height of abutment in these large spans is vastly greater than in the smaller ones, while, even in these last, it is more than twice as great as in the company's standard retaining wall.

Even the lightest of our abutments, as given above, would make an exceedingly heavy retaining wall, without any assistance from arch-thrust.

The lightest abutment allowed by our rule, in any case, has a thickness at base equal to half its height.

Now, Mr. Benjamin Baker, an eminently practical man, in a paper read recently before the Institution of Civil Engineers, sums up the result of a great number of recorded cases of retaining walls, as follows: "Experience has shown that a wall one-quarter of the height in thickness possesses sufficient stability when the backing and foundation are both favorable;" and "it has similarly been proved by experience that under no ordinary conditions of surcharge or heavy backing is it necessary to make a retaining wall on a solid foundation more than double the above, or half of the height in thickness." (The italics are mine). In the discussion which followed the reading of the paper, these were not criticised as being too light.

My father, whose rules for retaining walls require heavier profiles than those of the Pennsylvania Railroad, and have, I believe, been generally regarded as giving at least ample thicknesses, advises, for surcharged walls, somewhat greater widths, deduced from experiments with dry sand against wooden blocks (see Column T below), remarking, "we are confident that the following thicknesses at base will at least be found sufficient for vertical walls with sand."

Depth of backing—height of wall above ground multiplied by	T		P	
	Surcharge sloping up from back of wall. (Trautwine.)		Surcharge sloping up from front of wall. (Poncelet.)	
	Thickness at base=height of wall above ground multiplied by		Thickness at base=height of wall above ground multiplied by	
	Cut stone in mort'r.	Brick.	Cut stone in mort'r.	Brick.
1.....	0.35	0.40	0.35	0.452
1.5.....	0.52	0.57	0.579	0.726
2.....	0.58	0.63	0.707	0.930
3.....	0.64	0.69	0.883	1.25
25 or more.....	0.68	0.73		
31.....			0.926	1.32
Infinity.....			0.934	1.34

But when we allow for the assistance received from the thrust of even a semi-circular arch, I think the minimum thickness for abutment of arch, by the rule, will be found about as safe as the above maximum thickness for retaining wall in Column T.

For cases where the surcharge covers the top of the wall, as in culverts, my father quotes Poncelet as giving, for walls backed with dry sand, the thicknesses in Column P, but ap-

pears to consider them excessive, for he remarks: "Notwithstanding Poncelet's high position, the writer cannot imagine that the base of a brick wall need be so great as $1\frac{1}{2}$ times its height for any height of sand whatever."

With reference to Dr. Scheffler's dimensions for abutments 5 ft. high, as quoted by Mr. Low in your issue of 13th inst., I think from his table, as I find it partially quoted in Becker's "Brucknenbau," p. 117, that they were proportioned with reference principally to the thrust of the arch and the load of masonry above its crown, and not from an apprehension of great pressure from a high embankment; for, while his thicknesses increase (up to a certain point) with the height of masonry above crown, they decrease with the height of the embankment. Thus, as quoted by Becker, the "safety of 3 for railroads" is for "railroad bridges in low embankments;" while for "railroad bridges in medium and high embankments" he requires a safety of only two and a half, and, of course, correspondingly lighter abutments. Again, Scheffler's thicknesses for abutments fifteen feet high bear nothing like these enormous proportions to their heights. I give the table for 20 ft. semi-circles as far as given by Becker:

Height of abutment below the springs.	Height of masonry filling above crown.	THICKNESS OF ABUTMENT WITH A SAFETY OF		
		2	$2\frac{1}{2}$	3
		Highway bridges in medium and high embankments.	Highway bridges in low embankments or R.R. bridges in medium and high embankments.	R.R. bridges in low embankments.
Feet.	Feet.	Feet.	Feet.	Feet.
5	0	3.2	4.0	4.8
15	0	4.3	5.2	5.9
5	2	4.8	5.9	7.0
15	2	6.4	7.6	8.7
5	5	5.9	7.3	8.6
15	5	7.9	9.4	10.7

And, further, Scheffler gives (with one exception) greater thicknesses for a central angle of only 100° 16' and span of 16 ft., than for these 20 ft. semi-circles; and still greater ones for central angle 73° 46', span 18 ft.

Becker ("Baukunde," 1883, p. 222) distinctly says: "Walls for culverts under highways or railroads are proportioned solely with reference to the earth pressure. On the Swiss Central road the following dimensions are used": (The shapes of the arches are not given.)

SPAN.	Height of abutment.	THICKNESS OF ABUTMENT.			
		At springs.		At base.	
		Actual.	Trautwine.	Actual.	Trautwine.
Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
2.0	3.3	2.0	2.3	2.3	2.6
5.0	3.3	2.6	2.7	3.0	3.0
2.5	3.9	2.0	2.4	2.8	2.7
2.5	4.9	2.3	2.6	3.1	3.0
5.0	4.9	2.6	2.9	3.5	3.2
5.0	6.6	3.0	3.0	3.8	3.6
6.5	6.6	3.0	3.3	3.8	3.8
5.0	8.2	3.3	3.4	4.1	4.1
6.5	8.2	3.6	3.4	4.4	4.1
6.5	9.8	3.6	4.1	4.6	4.9
10.0	9.8	3.9	4.1	4.9	4.9
6.5	11.5	3.9	4.8	4.9	5.8
10.0	11.5	4.6	4.8	5.6	5.8
10.0	13.1	3.9	5.4	5.6	6.5
10.0	14.8	3.9	6.2	5.6	7.4

As you will notice, these average rather less than the thicknesses by our rule, which I have added for the purpose of comparison, assuming, for convenience, that the arches are semi-circles.

The destructive pressure of the backing upon the abutments of a culvert is perhaps considerably less than would be supposed from a first glance at your figs. 7 and 8 of Jan. 23, from which it might be inferred that the abutment was pressed inward by all of the earth in the triangular prism included between the dotted sloping line on either side, a vertical line drawn upward from the toe of the abutment, and the top of the embankment. But such a wall, even if the arch and the opposite side of the bank be removed, is usually, and perhaps as correctly as the nature of the case permits, regarded as being acted upon only by the prism of earth bounded by the back and top of the wall, the natural slope of the backing, and its "slope of maximum pressure." In the case of an abutment under an embankment, the pressure of this prism is increased by that of the earth resting upon it; but, on the other hand, the stability of the abutment is increased, not only by the vertical pressure of the earth resting upon its top, but also by the increased outward thrust of the arch.

And here I would remark that Scheffler's thicker abutments for "railroad bridges in low embankments" than for "railroad bridges in medium and high embankments" indicate that he regards the earth pressure as ceasing to increase, and the abutments as gaining in stability, when the embankment becomes "high."

You have kindly strained a point to credit our rule with giving a slightly heavier abutment to a semi-circular culvert than to a segmental one of the same span in order to make up for the lack of assistance from arch thrust in the former; but if the discrimination had been made for this purpose, the abutments should have continued to become thinner as the arch became flatter, whereas, as already remarked, when the central angle is much less than 120°, our rule, like Scheffler's

table, gives much heavier abutments. It would appear, therefore, that the rule was framed chiefly with reference to the arch thrust, in culverts as well as in bridges, and because it was found that in providing for the latter the earth thrust was also provided for, at least in low abutments.

On page 347 of the "Pocket-Book" my father remarks: "The additional thicknesses thus found below *sp* have reference rather to the pressure of the earth behind the abutment than to the thrust of the arch. In a very high abutment (my italics) the inner line *gp* would give a thickness too slight to sustain this earth safely." From this it appears (first) that he does "seem to have had in mind an essential difference of condition," and (second) that he regarded this difference as existing between a culvert or bridge with a low abutment and a culvert or bridge with a high abutment, rather than between a culvert and a bridge with the same height of abutment; because much of the earth in a high embankment exerts but a slight and indirect pressure upon the abutment, while with every increase of such pressure the abutment gains stability from the increase of vertical pressure upon its top, and from the increased arch thrust, besides which a high embankment increases the proportion of dead to live load, and thus diminishes the effect of tremors from passing trains, so that, as Scheffler's thicknesses indicate, a high embankment acts, to a great extent, conservatively.

I think, therefore, that if our rule is at fault, it is in not providing a great enough factor of safety against the sudden increase of arch thrust and violent jarring produced by modern engines rushing at 40 or more miles per hour over bridges of moderate span, say from 15 to 40 ft., and low rise, where the weight of the moving load still bears a considerable proportion to that of the bridge, but where the arch and its abutments are protected by little or no intervening masonry or earth. If experience has shown this to be the case, I should be most glad to have the particulars, in order that the necessary modifications may be made in the rule.

JOHN C. TRAUTWINE, JR.

[It was with reference to just such abutments as figs. 6 and 7 that we criticised Mr. Trautwine's rules as, while in general remarkably correct, "giving somewhat lighter abutments for small structures than average practice approves." Such, we think, are the abutments shown, as in a measure proved by the other abutments from the same road. Good (or at least carefully worked out) German authority can be advanced for almost anything, but theories which give an abutment 14.8 ft. high and only 3.9 ft. thick for a 10 ft. span, are hardly worth discussing. A rough and ready rule for proportioning abutments of small arches, which we apprehend is more used than any other in practice, is that they shall never be less than 5 ft. thick, unless the height is less than 6 ft., when they may be reduced, if the arch is not too flat, to not less than 0.8 of the height. The superimposed dead and especially live load in figs. 1 and 2 would probably materially alter the computation of comparative stability obtained by considering the weight of arch and backing alone, if it were possible to include them in the computation, which it is not. Both abutments are no doubt safe enough, but the semi-circular would probably have a much larger factor of safety in railroad service.—EDITOR RAILROAD GAZETTE.]

Retrenchment Papers.

I.

GENERAL CONSIDERATION.

In these days of reduced earnings, floating debts, passed dividends, defaulted coupons and their attendant train of receiverships and foreclosures, the mind of every operating officer exercising any control over the corporation purse strings, naturally turns to the subject of retrenchment.

In theory the maximum of economy should govern the disbursements of a well-managed road; but theory is one thing, practice another. Perfection can be found in no department of human action, and fault should not be found with an otherwise efficient management, if in times of financial depression a rigid economy can detect some means whereby expenses may be reduced without reducing the efficiency of the service, or causing a marked deterioration of the plant.

In general it is true that no short-sighted policy of temporary saving, which curtails present expenses regardless of the ultimate effect, can be called truly economical. The old saying about the stitch in time saving nine, finds pointed application here, and the penny saved to-day by reducing the number of men on sections to the lowest terms, or deferring needed repairs to the plant to some future day, will, it is most likely, be offset hereafter by an increased expenditure of very many pennies; for whether it be road-bed or rolling stock, deterioration progresses much more rapidly when out of repair than when in first-class condition.

There is, however, an exception to this rule. A manager operating in the stockholders' interests, must first meet mortgage charges if he would save the property. His first duty is of course to the traveling public, to render the road safe. Next, to operate it that net earnings shall, if possible, be at least sufficient to meet fixed charges. Of course, where these charges are so heavy that even in good times they can scarcely be met, it is time that the road went through a foreclosure process, and had some of its burdens removed. It will frequently happen, however, that a road which in good times can easily meet its interest charges, will, in times of financial depression like those of the past few months, find it impossible

so to do. Or, again, a road that even in ordinary times has been unable to make "both ends meet," may, nevertheless, have a promising future before it, with chances for a marked development of traffic. In such cases it may be possible, by reducing the operating force, and deferring many items of expense which theory unmodified by practice demands should be at once incurred, to avoid a threatened foreclosure and carry the road through to better times, when any increased charges consequent upon a slight deterioration of the plant can be readily taken care of.

Theory demands for present use a generous allowance of good ties, steel rails of a weight adapted to the traffic, and an efficient force of section men to maintain the track in proper surface and alignment, but there is a point of excellence in permanent way and rolling stock beyond which increased excellence does not mean increased comfort and safety so much as it means decrease of operating expenses, and this decrease is one spread over a long series of years, and for the small saving effected this year does not bring much present relief to a road when net earnings are already dangerously small.

When this point of excellence is reached, a manager's duty to the public to render the road safe is reasonably fulfilled, and before additional expenditures are incurred it is time for him to consult the stockholders' interests.

If the road is kept reasonably safe, it were better to let the plant fall below ideal perfection if thereby fixed charges can be met, and the property saved from foreclosure. Questions of this kind must frequently be settled by operating officers, and the case always calls for the exercise of the nicest judgment. The usual question is, How far will it answer, all things considered, to curtail and retrench? It is evident that the policy which decrees a present saving, and at once makes a furious onslaught on the pay-roll and the bills of the supply department, seeking only temporary and present relief, which must certainly be hereafter repaid with usury, can be justified, if at all, only as a last resort to avert a foreclosure, and then only when there is a reasonable hope of the return of better times before the efficiency of the plant shall have been irretrievably impaired. When, as is too often the case, such means are used to continue the payment or prevent the reduction of dividends, the policy is short-sighted in the extreme. No manager having the best interests of the property at heart will continue to pay them at any time, unless, meanwhile, he can keep the property fully up to its standard of excellence. A prominent trunk line, in a statement recently published explaining the passing of its last quarterly dividend, voices this principle in the following language: "While the utmost practical economy has been put in operation in all departments, the road, equipment and property have been fully maintained."

The question of retrenchment in the abstract is a simple one; it is the application of it in its details that becomes difficult and absorbing. The problem takes practical shape somewhat as follows:

1st. What amount in gross will the road probably earn during the next year quarter or month as the case may be?

2d. What will it cost to operate the road during that period?

3d. What fixed charges will have to be made out of the net earnings so realized?

The amount of fixed charges is of course constant, and is as inexorable as the law of the Medes and Persians, which altereth not. The probable gross earnings must be estimated, but usually there is sufficient data at hand to enable a reasonably close estimate to be made. Comparisons of past earnings with present, coupled with an intelligent and comprehensive view of the financial situation and the general condition of the country, will avail much. Considerable help can be obtained from the columns of railroad journals, from their editorials and the tables of earnings of other roads which they publish from time to time. When properly used, these sources of information are to the manager what the barometer is to the seaman, forecasting the approach of coming storms. Financial journals and the daily papers, Poor's Manual and the reports of the railroad commissioners of the several states are also of use in forming such an estimate. When this estimate of probable gross earnings is once made, and the fixed charges subtracted therefrom, the remainder is, of course, the limit within which operating expenses must be kept in order to save the road from financial disaster, and the next thing in order is a rigid analysis of every item of the operating expense account, with a view [to effecting all possible] reductions and bringing the sum total of those expenses within this limit, with as large a margin for dividends as possible; and here is where the real work of retrenchment begins, and where many an anxious and careful scrutiny of each separate item of expense is imperatively demanded if any considerable retrenchment is to be effected. Some form of distribution, so called, of the expense vouchers is in vogue with most roads, for without it any intelligent and economical supervision over expenses is impossible. Each general class of items in the distribution must be examined separately, and should receive the attention which its importance demands. While roads vary greatly in the details with which they make this distribution, yet after all there is a certain general resemblance in their practice, as the more important subdivisions are so obvious as to prevail in almost every system.

The following table, compiled from the Report of the Connecticut Railroad Commissioners for the year ending Sept. 30, 1883, shows the results of the operation of all roads reporting to them (1,388 miles), and I have arranged all subdivisions of the operating expense account amounting to at least 1 per cent. of the sum total, in the order of magnitude. On the whole, this table may be taken in a general way, a

indicating the relative importance of the several items of the distribution in all parts of the country, and at all times:

Distribution of the Operating Expense Account of all roads reporting to the Connecticut Railroad Commission, Year ending Sept. 30, 1883.

	Per cent of total.
Total operating expenses all roads.....	\$11,890,389.50
1. Salaries and labor not otherwise stated.....	3,539,932.87 30
2. Repairs to road-bed and track.....	1,949,826.30 16
3. Miscellaneous expenses.....	1,587,751.85 13
4. Fuel for locomotives.....	1,371,186.88 12
5. Repairs to cars.....	872,084.64 7
6. " locomotives.....	738,457.02 6
7. " bridges.....	361,783.74 3
8. " buildings and fixtures.....	324,261.35 3
9. " machinery and tools.....	110,751.68 1
10. Oil and waste.....	152,704.70 1
11. Injuries to persons.....	112,520.45 1

If we attempt to assign to each department its proportionate share of the expense account we shall arrive at the following conclusions:

Division Superintendent:	
For pay rolls not otherwise distributed.....	3 30 p. c.
Master Mechanic:	
For fuel for locomotives.....	12 p. c.
" repairs to locomotives.....	6 " 20 p. c.
" repairs to machinery and tools.....	1 " "
" oil and waste.....	1 " "
Master Car Builder:	
For repairs to cars.....	7 p. c. 10 p. c.
" repairs to buildings and fixtures.....	3 " "
Road Master:	
For repairs to road-bed and track.....	16 p. c. 19 p. c.
" repairs to bridges.....	3 " "
Miscellaneous expenses.....	13 p. c.
Other expenses not specially noted.....	8 " 21 p. c.
	100 p. c.

This is of course only a rough approximation, serving as a guide to the more important sources of expense. No two roads of course administer their affairs precisely alike, although striking analogies are always presented. Sometimes the master mechanic acts also as master car-builder. Again we may find an engineer in charge of road, bridges and buildings, with a roadmaster, foreman of bridge repairs and master carpenter as subordinates; or the repairs of bridges and buildings on short lines may be turned over to the master car-builder. In all such details managements vary greatly.

The main thing from the standpoint of retrenchment is to form an intelligent conception of what are the important items in the company's expense account, in order that efforts to retrench may be made where they will have the most telling effect. A rough statement easily remembered is that of the total operating expenses, motive power and rolling stock are responsible for about one-third of the whole, the train and station service for about another third, and that of the remaining third about one-half goes for maintenance of way, i.e., section men and the supplies used by them, these three sub-divisions absorbing altogether about five-sixths of the entire expense account.

The detailed consideration of these several sources of expense I must defer to future papers. EDWIN A. HILL.

Improved Double Tire Rolling Machine.

A firm of English engineers, Messrs. Collier & Co., of Manchester, has recently constructed a tire rolling mill for Italy. The machine has two sets of rolls, one for roughing out the blooms as they come from the hammer, and which brings them to within a few inches of the required size; the second set finishes the work and leaves it perfectly true of the exact size and section. Both sets of rolls can be operated at the same time, so that one end of the machine can be finishing a tire while the other is roughing out a bloom. The tires on leaving the roughing rolls are passed to the finishing rolls by means of a small hydraulic crane, and are there finished without the necessity of reheating. This arrangement is advantageous, inasmuch as the scale is all removed from the blooms in the roughing process, and the finishing rolls are consequently kept clean, thus allowing a more perfect finish to be given to the work than when only one pair of rolls is used. Messrs. Collier & Co. usually supply with these machines a pair of horizontal engines for giving the motive power, but where water is very plentiful a turbine will be used for that purpose. The machine will take about 500 horse-power to drive it. The pressure is put on the rolls by means of hydraulic cylinders, there being one cylinder for each of the roll slides; an additional smaller cylinder is also supplied to each slide for bringing them back to allow of the finished tires being removed. The object of these small cylinders is to get a quick return motion. The hydraulic pressure is obtained by a pair of pumps, having large and small plungers, the former of which bring the slides up to their work and then throw themselves out of gear, the final pressure being put on by the small plungers. The pumps are worked by two steam cylinders attached to the side of the pump cistern. The hydraulic and turbine valves are placed near to each other, so that the whole machine is under the control of one man. The finishing rolls are provided with side rolls for making the tires perfectly true, and with top and bottom rolls for rolling the edges of the tires at the same time. The roll shafts are made of Bessemer steel, and run in phosphor-bronze bearings, and the whole machine is made very strong. The heaviest steel tires can be rolled from 18 in. to 9 ft. diameter.—*Mechanical World.*

ANNUAL REPORTS.

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Texas & New Orleans.

The report of this company for the year ending Dec. 31 last says: "On July 1, 1881, the present owners acquired the main line from Orange to Houston, forming, in connection with other lines controlled by the same interests, a part of the Southern Pacific line from New Orleans to San Francisco. In April, 1883, they purchased the line from Sabine Pass to Rockland, known as the Sabine Division. The company owns and operates the following mileage:

Main line, Orange to Houston.....	104.16
Sabine Division, Sabine Pass to Rockland.....	103.57
Total.....	207.72
Sidings, main line 25.49; Sabine Division, 10.98; total 36.47 miles.	

"Since its acquisition the entire main line has been relaid with steel rails, and large expenditures incurred in raising and ballasting the road-bed and improving its physical condition wherever required, to prepare it for handling the transcontinental traffic over it with dispatch and economy. During the year 3.54 miles were ballasted with sand. On the Sabine Division 20 miles are laid with steel and 60 miles ballasted."

The equipment consists of 14 locomotives; 9 passenger, 3 sleeping, 6 combination and two baggage, mail and express cars; 162 box, 25 stock, 685 flat and 7 caboose cars; 1 road car.

The general account, condensed, is as follows:

Stock.....	\$5,000,000
Funded debt.....	4,765,507
Accounts and balances.....	486,437
Income account, balance.....	861,574

Total.....	\$11,113,518
Road and property.....	\$10,433,687
Supplies.....	69,914
Cash and sundry assets.....	609,937
	11,113,518

The funded debt includes \$1,620,000 first 7s; \$2,075,000 Sabine Division 6s; \$584,000 debenture 6s and \$486,507 Texas school fund loan. The last-named loan is payable 2 per cent. yearly.

The earnings for the year were:

	1884.	1883.	Inc. or Dec.	P. c.
Freight.....	\$923,221	\$936,221	D. \$13,000	33.4
Passengers.....	171,111	169,505	I. 1,606	0.9
Mail, etc.....	77,432	57,463	I. 19,969	34.8
Total.....	\$872,142	\$1,163,189	D. \$291,047	25.0
Expenses.....	516,622	574,705	D. 58,083	10.1

Net earnings.....\$355,520 \$588,484 D. \$232,964 39.6
Gross earn. per mile.....6.397 D. 2.215 34.6
Net ".....1.714 3.236 D. 1.522 47.0
Per cent. of exps.....50.2 49.4 I. 9.8

There were 24,774 new ties used in renewals. The earnings per train mile were: Passengers, 195.40 cents; freight, 342.50; all trains, 157.11; expenses, 93.06; net earnings, 64.05 cents.

The result of the year was as follows:

Net earnings, as above.....	\$355,520
Taxes, etc.....	\$18,119
Interest on bonds.....	\$303,100
	321,219
Surplus for the year.....	\$34,301
Balance from previous year.....	\$27,273
Surplus, Dec. 31, 1884.....	\$61,574

Expenditures charged to new construction account during the year amounted to \$43,362. The report says: "It will be observed there has been a remarkable diminution in the gross earnings, and we may properly say exceptional, as an unusual number of causes have operated to produce this result, and it may be years before a similar combination of disastrous causes may occur again. We have not only suffered from the decline in local business, a sequence of the failure of the cotton crop in Texas for two successive years, and the general shrinkage in revenue from diminished traffic and rates in common with other railroads, owing to the general prostration throughout the entire land, but we have also suffered considerably from the suspension of traffic occasioned by exceptional floods on the western extension of the G., H. & S. A. Railway from May 26 to July 11, and the Morgan's Louisiana & Texas railroads east of us, and also from serious interruptions on our own line from the same causes, from May 25 to June 23. * * *

"In addition to 114,481 acres of good pine lands purchased by the company, they acquired also with the purchase of the main line about 818,789 acres of state subsidy lands, of which all but 40,960 acres have been patented; and with the purchase of the Sabine Division, 1,037 certificates of 640 acres each—663,680 acres. We were unable to locate the latter, however, the state of Texas having for the present withdrawn all state lands from entry, and the matter is now suspended, awaiting the results of the re-survey of the located lands in the excepted counties. The company also owns several other small parcels of lands and valuable terminal property in Houston. The lands obtained with the main line are distributed in various sections of the state; about 716,789 acres are reported as grazing and agricultural lands; and 102,000 acres as timber lands."

Since the close of the year the road has been leased to the new Southern Pacific Co., with the other roads forming the line from San Francisco to New Orleans.

Louisiana Western.

This road extends from Lafayette, La., to Orange, Tex., 112.03 miles, and has 11.65 miles of sidings. It is the connecting link between the Texas & New Orleans on the west and Morgan's Louisiana & Texas on the east. The report is for the year ending Dec. 31 last.

The entire line is laid with steel rails and ballasted with sand loan, the only material obtainable in that section. The equipment consists of 9 locomotives; 4 passenger, 3 sleeping and two baggage, mail and express cars; 122 box, 50 stock, 125 flat and 6 caboose cars.

The general account, condensed, is as follows:

Stock.....	\$3,390,000
Funded debt.....	2,240,000
Accounts and balances.....	102,824
Income account, balance.....	242,410

Total.....	\$5,945,234
Road and property.....	\$5,656,149
Supplies.....	19,940
Cash and accounts receivable.....	289,145
	5,945,234

The funded debt is all of one issue, first-mortgage 6s, amounting to \$20,000 per mile.

The earnings for the year were:

	1884.	1883.	Inc. or Dec.	P. c.
Freight.....	\$287,395	\$432,130	D. \$144,735	31.8
Passengers.....	160,914	150,476	I. 10,438	6.9
Other sources.....	37,398	29,514	I. 7,884	26.7
Total.....	\$485,707	\$602,120	D. \$116,413	19.3
Expenses.....	269,162	342,532	D. 73,370	21.4

Net earnings.....\$216,545 \$259,588 D. \$43,043 16.6
Gross earn. per mile.....4.337 5.376 D. 1,039 19.3
Net ".....1.833 2.318 D. 385 16.6
Per cent. of exps.....55.0 56.9 D. 1.9

The earnings per train mile were: Passenger, 157.46 cents; freight, 263.29; all trains, 239.81; expenses, 127.35; net earnings, 102.46 cents.

The result of the year was as follows:

Net earnings, as above.....	\$216,545
Other receipts.....	2,439
Total.....	\$218,984
Taxes and other expenses.....	\$18,675
Interest on bonds.....	134,400
	153,075
Surplus for the year.....	\$65,909
Balance from previous year.....	176,501
Surplus, Dec. 31, 1884.....	\$242,410

Earnings were decreased by the failure of cotton crops and general stagnation in business, and by the stoppage of traffic over connecting lines for nearly a month by wash-outs.

The report says: "The physical condition of the road-bed and superstructure has been fully maintained; 20,362 pine and 11,755 cypress ties, a total of 11.31 miles, have been put in the track. The locomotives have been maintained at average efficiency, but owing to limited facilities at Houston, the freight equipment has not been maintained as fully as we desired; but steps have been taken to provide the necessary shops and appointments as early as practicable. In addition to the operating expenses above referred to, there has been expended also the sum of \$10,169 for betterments."

"Since the close of the year the organization of the Southern Pacific Co. has been consummated, by means of which the entire line from San Francisco to New Orleans will be unified in policy and management, affording better service to the public and greater efficiency in administration."

Western North Carolina.

This company owns a line from Salisbury, N. C., to Paint Rock on the Tennessee line, 190 miles, with a branch from Asheville to the Nantahala River, 84 miles, making 274 miles in all. Of this, 66 miles, from Pigeon River to the Nantahala, were built last year and not brought into operation until the close of the year. The report is for the year ending Sept. 30. The road is controlled by the Richmond & Danville through the Richmond & West Point Terminal Co.

The equipment includes 16 locomotives owned and 3 leased; 5 passenger, 5 combination and 3 baggage and mail cars; 17 box, 11 stock, 71 coal, 25 flat and 9 caboose cars; 4 shanty or construction cars. Six new locomotives and 225 freight cars are much needed.

The general account, condensed, is as follows:

Stock.....	\$4,000,000
Funded debt.....	6,180,000
Accounts and balances.....	238,628
Profit and loss.....	343,937

Total.....	\$10,750,565
Road and property.....	\$10,180,000
Construction, new cars, etc.....	288,475
Fuel and materials.....	13,042
Accounts receivable and cash.....	200,048
	10,750,565

The funded debt consists of \$850,000 first-mortgage bonds, \$2,240,000 first consols and \$3,060,000 second consols.

The traffic for the year was as follows:

	1883-84.	1882-83.	Increase.	P. c.
Passengers carried.....	101,445	80,936	20,509	25.4
Passenger-miles.....	4,200,015	3,674,760	525,255	14.6
Tons freight carried.....	95,847	79,428	16,419	20.7
Ton-miles.....	11,391,248	9,425,689	1,965,559	20.9

The express business amounted to 560 tons carried 44,529 miles. About 70 per cent. of the freight traffic was east-bound business. Only about 7 per cent. was local business. The average passenger journey last year was 41.5 miles; the average freight haul was 118.8 miles.

The earnings for the year were:

	1883-84.	1882-83.	Increase.	P. c.
Freight.....	\$263,329	\$203,731	\$59,598	29.2
Passage.....	145,227	119,077	26,150	22.0
Mails, etc.....	26,513	22,485	4,028	17.9
Total.....	\$435,069	\$345,293	\$89,776	26.0
Expenses.....	293,486	294,949	86,537	30.5

Net earnings.....\$141,583 \$120,344 \$21,239 17.7
Gross earn. per mile.....2.112 1.676 436 26.0
Net ".....687 584 103 17.7
Per cent. of exps.....67.5 65.2 2.3

The net earnings were carried to profit and loss, making, with a balance of \$202,046 from previous year and \$308 from old accounts, a total credit of \$343,937 to that account.

The Superintendent reports that under the pressure of the contract to complete the road to the Nantahala River the construction and operating expenses were closely interwoven, and no separate charges are made for transportation against construction. Much progress has been made in the work of improving the older portion of the road and putting it in good condition. The road-bed has been much improved, sidings extended, trestles and bridges rebuilt, and 78 miles relaid with steel rails. There are still 28 miles of old chair rails which should be replaced as soon as possible, and besides these there are 67 miles of track laid with iron rails with fish-joints. The total renewals include 6,984 tons of steel rails, 69,524 new ties, and 546 ft. of trestles filled in. The total cost of this work was \$247,075.

The President's report says that the conditions of the contract with the state have been fully carried out by the completion of the line from Asheville to the Nantahala River, and by the payment of \$600,000 to the state May 1, 1884, and the deposit of \$30,000 in state bonds. The company now holds the title to the road entirely clear. During the year, by agreements with the bondholders, the first mortgage bonds issued at the rate of \$15,000 per mile have been canceled and replaced by consolidated bonds at the rate of \$12,500 per mile, of which \$850,000 are retained by the trustees to replace the old issue of state bonds, which are a first lien on the road. There will also be issued second-mortgage bonds at the rate of \$15,000 per mile on the entire line. The earnings of the road have shown considerable increase, although it has not received as much traffic from its western connection as was expected. This business will probably come hereafter.

A small force is at work on the 40 miles remaining to be built from the Nantahala River to Murphy, and 8 miles are now graded and ready for the track. On the remaining 32 miles there are 4 miles of very hard work which will take some time to complete.



Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

LEGISLATION FOR THE PROTECTION OF RAILROAD INTERESTS.

There have been of late indications of a disposition on the part of railroad men to call upon the government to assist in protecting the interests of railroad proprietors against the injury caused by an undue increase of competing lines, and even against the harm they do each other in their struggles to secure business. Some time ago Mr. Marshall M. Kirkman, of the Chicago & Northwestern, published a considerable pamphlet, in which he urged what is substantially the French system—a strict limitation of construction of railroads to what is actually required to serve the community, and close restriction by government authority of the rates to be charged. At the great meeting of railroad managers in Chicago, April 1, Mr. Devereux urged with great earnestness practical action to secure protection, and secured the passage of a resolution providing for the early call of a convention, at which a report on the evils now suffered and the new legislation proposed to remedy them shall be submitted to the consideration of state railroad commissioners, Congressional committees, and representatives of commerce and industry, for the purpose doubtless of convincing the great majority of the community, who pay for railroad transportation, that legislation may be had to protect railroad owners which will be of advantage to the community at large.

Those who have a wide acquaintance among railroad managers know that it is nothing new for them to say privately that the railroads need the support of the law in their efforts to maintain rates which will yield some profit on through traffic, and that to secure that support they might submit to some limitation of their present powers. What is new is that some of them are now willing to express themselves publicly in favor of such legislation, and even, like Mr. Devereux, to make a public effort to have something done. As the demands for legislation commonly made tend to reduce the profits of railroads, and much of the legislation proposed is intended to reduce them, the representatives of railroad investors naturally have been very shy of suggesting legislation, feeling that they were much more likely to be harmed than helped by any that would be enacted. That at last some of them venture publicly to propose legislation argues, perhaps, not so much the conviction that the community is more enlightened or disposed to do justice, as despair of effecting anything without legislation—the drowning man's grasp at a straw.

We have heretofore intimated that the railroad companies might find it desirable to ask for, and the community to grant, legal sanction to the cooperative agreements of the railroad companies. Nearly seven years ago (June 14, 1878, "The Legal Sanction of Combinations") we endeavored to show that the railroad companies lie under an exceptional difficulty in regard to enforcing their contracts, because of the real or assumed lack of power in them to enforce their agreements with each other when these agreements are for the purpose of maintaining rates. We said then that the popular feeling that a combination of the railroads

meant a conspiracy against the public stood in the way of any legislation to legalize combinations, unless by the same legislation something of public advantage should be granted by the railroads.

A good deal has occurred in the last seven years. Hundreds of millions of dollars have been invested in railroads, and hundreds of millions of dollars of railroad investments have become profitless, and there has been especially a great deal of experience with railroad combinations for maintaining rates. The public possibly has a more realizing sense than then of the dangers attending railroad investments (though that had been fully proved before); the fears of extortion by means of combinations are probably less; but certainly popular distrust of combinations has not ceased, and confidence in the possibility of carrying out an agreement which cannot be enforced by law, which was very slight then, is perhaps more so now. That it was very slight then, the article we mention itself shows. An attempt to establish an east-bound pool had just failed, and the feeling seemed to be general that, while an agreement of a small number of companies like the Eastern trunk lines or the Chicago-Council Bluffs roads might be carried out, one including a large number of lines, some with a very large and some with a trifling interest in the business, like those by which east-bound freight was shipped, could not be made effective for lack of power to compel the companies to do as they agreed. "A little while ago," we said, "the difficulty was to get people to agree. That difficulty seems to have been got over with wonderfully well in many cases recently. * * * Now the people are troubled to know how they shall enforce their agreement after they have made it, and naturally this brings to their minds the law, the ordinary instrument for enforcing the obligation of contracts. In various quarters the wish is expressed that contracts may be so made between the companies, and such legislation be obtained, that a combination of companies to maintain rates and divide traffic may be enforced by the courts, like the contract for a lease of a road, or one for the purchase of materials."

Thus we find that there was great distrust of the possibility of an effective combination to maintain east bound rates before there had been anything more than an effort to form one, very much like what we find now after some years of trial, which has been for a considerable part of the time successful and very beneficial, though recently for most of the time ineffective; and that there was then to some extent the disposition, which was more decidedly expressed at the late Chicago meeting, to call for a legal sanction which will transfer the cooperative agreements of the companies into contracts enforceable in the courts.

Concerning this we said in 1878: "Probably it is too early to expect anything of this kind yet for a while. The railroads must first satisfy themselves thoroughly as to what they need. When they are fully convinced as to the policy which it will be wise to adopt, then they may ask for help to enable them to adopt it, if they cannot without help. It is not wise to look to legislation for help out of every difficulty, and it will be altogether vain to expect that legislation in this matter will be able to do anything more than to enable the companies to help themselves. They must not ask the legislative power to manage their business for them; it would make fearful work of it; nor need they ask for any exceptional powers. It is the present limitation of their power to make contracts which are binding before the law which is exceptional."

Much has happened in the seven years since this was said, but it is doubtful if the railroad companies even now are fully satisfied and agreed as to the policy which it would be wise for them to adopt as a permanency. It never should have been expected that the efforts at cooperation, covering a continental railroad system, should be successful from the first. A problem so vast and complicated, and involving so many conflicting interests, is rarely solved except after many wholly or partly unsuccessful efforts. There are too many unknown and variable quantities to permit of a short and easy solution. Usually, many efforts must be made, and not unfrequently a general solution, once for all, is impossible; but the most to be hoped for is a means of disposing of questions after they arise, which will aim at justice and secure it approximately, but the chief virtue of which is that it disposes of contests in some way which is actually accepted, whether acceptable or not, by the contestants—which is all that the whole machinery of the courts secures for the community at large. Perhaps the committee which Mr. Devereux's resolution called for would be able to formulate what the railroad companies would like to have done. We doubt it, however. It is question-

able whether there is yet any firm conviction on their part as to what would be best for them, and especially as to what they are willing to give the community in return for the new powers or protection they desire. They will probably have to work out their own salvation for some time yet. When they are fully satisfied and generally agreed as to the policy which they should follow, then if legal sanction is needed to enable them to adopt and enforce it, they may ask for it, but with no hope of getting it unless they can at the same time convince the public that what they ask, coupled it may be with concessions which they offer to include with it, is for the public interest. This will not be the work of a day. Even should the railroads early agree as to what they want, they are not likely so quickly to agree as to what they will give for it; and, this accomplished, comes the very difficult task of convincing an indifferent public that what they ask is reasonable and just and for its interest. Perhaps it is not too early to call serious attention to the matter, but it can hardly be expected that changes in legislation can be soon secured.

March Earnings.

Further reports of March earnings of railroads northwest of Chicago show more losses than gains over last year, while the great companies reported large gains last week. We saw then that the Chicago, Milwaukee & St. Paul had gained 16½ per cent., the Chicago & Northwestern 9½ per cent., the St. Paul & Omaha lost 2½ per cent., the Central Iowa gained 11½ per cent., the Iowa lines of the Illinois Central 2 per cent., while the Northern Pacific lost 30 per cent. and the Manitoba 17½ per cent.

This week the Burlington, Cedar Rapids & Northern reports a gain of 25½ per cent. and larger earnings than ever before in March, and the Milwaukee, Lake Shore & Western a gain of 2½ per cent., while the Marquette & Ontonagon loses 10½ per cent., the Wisconsin Central 3½ per cent. and the St. Paul & Duluth 6½ per cent.

South and southwest of Chicago we had last week a decrease of 2½ per cent. on the Chicago & Alton and an increase of 32½ on the Eastern Illinois. This week the Illinois lines of the Illinois Central report a gain of 14½ per cent., the Peoria, Decatur & Evansville a decrease of 13 per cent., the Wabash a gain of ½ per cent., the St. Louis & San Francisco a decrease of 7 per cent., the Fort Scott & Gulf a gain of 3½ per cent., the Fort Scott & Wichita a gain of 2 per cent.

In the Far West the Denver & Rio Grande gained 23½ and the Denver, Rio Grande & Western 11½ per cent. The Central Pacific is late in reporting.

In the South the reports so far are generally very favorable, the only decreases reported being 1½ per cent. by the Florida Railway & Navigation Co., and 8½ by the Norfolk & Western. The latter's earnings were also 11 per cent. less than in 1883 and 1½ per cent. less than in 1881. The Richmond & Danville makes but a slight gain, and its March earnings have varied little from year to year for four years. The Charlotte, Columbia & Augusta has a gain of 10½ per cent. over last year, but had smaller earnings than in 1882. The Columbia & Greenville earned 15½ per cent. more than last year, but less than for two previous years. The new Western North Carolina gained 36 per cent. and the new Georgia Pacific gained 26 per cent. The Southern Division of the Illinois Central increased 12½ per cent., the Mobile & Ohio 5½, and the Louisville & Nashville 6 per cent. The earnings of the latter are the largest it ever had in March; those of the Mobile & Ohio were the largest since 1881. The Huntington roads, which have usually reported early, are late in reporting for March.

North of the Ohio River the Michigan lumber roads suffer especially, the Flint & Pere Marquette losing 27½, the Detroit, Lansing & Northern 16½ and the Chicago & West Michigan 15 per cent., which is the more formidable because they had already had a decrease last year. Compared with 1883 the Flint & Pere Marquette last March earned 32 per cent., the Lansing road 31 per cent., and the West Michigan 25 per cent. less. The lateness of the season very likely has something to do with this. Very many other roads north of the Ohio have reported. The Indiana, Bloomington & Western shows a gain of 17½ per cent., the Cincinnati, Indianapolis & Chicago an increase of 11½ per cent. (but a decrease from 1883), and the Cincinnati, Washington & Baltimore a decrease of 6 per cent.

In the East the Hoosac Tunnel & Western last week reported an increase of 20½ per cent., and the Long Island an increase of 7½ per cent. This week the Grand Trunk reports a decrease of 11 per cent., following a decrease of 12 per cent. last year, the decrease being from \$1,380,821 in 1883 to \$1,087,700 in 1885—21 per cent. March was a very bad month for profits in

trunk-line traffic last year, but it has certainly been worse this year, for though east-bound rates may have averaged quite as much or possibly a little more last year, west-bound rates were a third lower, and through passenger rates not much more than half as high. The other trunk lines must have suffered more in amount than the Grand Trunk from these causes, but perhaps they have not lost so large a proportion of their total earnings.

Net Earnings in 1884.

We have compiled the gross and net earnings of all the railroads of this country that have reported them for the year 1884, or that report monthly or quarterly in such a way that they are ascertainable for the calendar when that is not their fiscal year, including several important roads which do not make a statement for the calendar year. The list includes a very large number of railroads that were not given in our monthly table published in the first week of February, and many very important ones which do not report at all monthly, including the whole western system of the Pennsylvania Railroad, and indeed most of the western connections of the trunk lines—the Lake Shore, the Michigan Central, the Nickel Plate, the New York, Pennsylvania & Ohio, and others, so much so that it covers by far the larger part of the railroads north of the Ohio, and especially of the important ones, while the monthly report includes very few. Of the Chicago railroads it includes the Chicago, Milwaukee & St. Paul, the Chicago & Northwestern, the Chicago & Alton and the Illinois Central—all the important ones except the Rock Island. It is most incomplete for the New England railroads, most of which report only for their fiscal year ending with September. The principal railroads southwest of St. Louis are included, most of which do not report regularly monthly. There remain, however, a considerable number of railroads whose gross earnings for the calendar year were given in our table of Feb. 6 which have not yet reported their net earnings for that year, some of which usually do not ever report them for that period.

The aggregate gross and net earnings and working expenses in 1884 and 1883 of those railroads which have so far reported them have been as follows:

	1884.	1883.	Decrease.	P. c.
Gross earn.....	\$514,816,082	\$551,612,989	\$36,796,907	6.7
Expenses.....	326,909,527	337,709,506	10,799,979	3.2

	1884.	1883.	Decrease.	P. c.
Net earn.....	\$187,906,555	\$213,903,483	\$25,996,928	12.1

This includes 80 different railroads, whose gross earnings in 1883 were 68½ per cent. of the earnings of all the railroads in the United States as reported in Poor's Manual for 1883 (the Manual year including a very large number of roads reporting for the year to Sept. 30, and others for different years, a few including one or more months of 1884). The net earnings of these roads in 1883 were 73½ per cent. of the net earnings given in the Manual for all the railroads.

As in the aggregate the mileage worked by these railroads was considerably greater in 1884 than in 1883, the large decrease of 12 per cent. in net earnings means a considerably greater decrease in earnings per mile; and as with the larger mileage there were larger fixed charges, the decrease in the stockholders' profits must have been more than the \$26,000,000 decrease in net earnings. Now in 1883 (the variable year of Poor's Manual), the whole amount paid in dividends by the railroads of the country amounted to \$101,579,098. The reduction in net earnings last year was more than one-fourth of this amount. This is a very large decrease in profits to take place in a single year, in the face of a larger capital and greater mileage and increased rolling stock, and much more than is indicated by the monthly reports. Only a small proportion of the roads report their expenses monthly, and among those which do not so report were many of the roads which last year suffered great decreases in net earnings.

The average reduction of working expenses of 3½ per cent. may seem small, but not only was there a considerable increase of mileage last year, but several lines had a large increase of expenses with little or no increase in mileage, apparently due to the fact that their expenses were unduly small in 1883. In many cases heroic efforts were made to keep down expenditures last year, and in not a few, doubtless, a good part of the "saving" then will have to be made up with interest afterwards, as is always the case when there is a large falling-off of earnings.

The Railroads and the Cholera.

Dr. Michael Grossmann, Consulting Health Officer of the Austrian Northwestern Railroad, recently delivered a lecture before the Austrian Railroad Club, on the relations of the railroads to the cholera epi-

demic, based on our present knowledge of the manner in which the disease is propagated. Dr. Grossmann finds that the railroads less than any other means of conveyance tend to spread the cholera, while ships and other vessels afford the conditions most favorable to its development and conveyance from one port to another. He illustrates this by the fact that the cholera raged for many weeks in Marseilles and Toulon last summer without appearing at other French towns which were in communication with these cities by several trains a day; and that while the disease raged at Naples, Rome, near by but inland, escaped, while distant Genoa, communicating by ships, was attacked.

The most that can be done by the railroads to prevent the communication of disease through passengers who may have the disease is to keep the station privies and water-closets clean and in good sanitary condition, as the germ of the disease is conveyed only in the dejects of the cholera patient. Apparently Dr. Grossmann did not consider the closets of the cars themselves, these being not yet common in Europe. As the car closets are constructed now disinfection is almost impossible. Especial danger is to be apprehended from the closets of emigrant waiting rooms, as the emigrants before their arrival at the port and the beginning of their journey have been in circumstances favorable to the development of the disease, which may make progress during the journey before it is discovered. Evidently the best method of preventing this is by an efficient quarantine before the emigrants are permitted to land; but the sanitary condition of the station water-closets is a precaution not to be neglected, as it may spare an interior town an attack of the epidemic.

Dr. Grossmann finds, however, that more danger is to be apprehended from the conveyance of infected clothing by rail than from infected passengers, and this is something over which the railroads can exercise very little control in interior traffic. Dr. Grossmann proposes that when there is cholera in one country, at the border stations of adjacent countries all the baggage of all passengers should be minutely inspected, and all packages in which there is any soiled clothing should be buried incontinently, and he would give up entirely the methods of disinfecting baggage that have been adopted in some places. "He who ships dynamite on the railroads without declaring what it is," says the Doctor, "is rightfully punished severely by the law; and yet there can be no doubt that the soiled contents of a little satchel may, under certain circumstances, do more harm to the community than a dozen bombs and petards."

This can be managed on our coast and at frontier railroad stations; but the task for our railroads is most likely to be to prevent the spread of the cholera inland after it has become an epidemic at New York, Baltimore or New Orleans. This heretofore has never been done, we believe. If the cholera once got a foothold at a seaport, it extended to some extent in the interior. Yet there seems little doubt that it could be prevented by efficient measures, though they might be harassing and unpopular, and could not be taken by the railroads on their own responsibility. It is not the occasional movement of an infected traveler that is most to be feared, but the carriage of him or his infected effects under such circumstances that they are likely to become new centres of infection. Certain precautions against this the railroads can take; and they should see to it that nowhere on their property places are left in such condition as to become breeding-places for the cholera germ. Such places exist by the hundred, which should be abolished out of regard to decency as well as health. A thorough-going sanitary inspection of stations, but especially of privies and water-closets, by some one who knows what a bad sanitary condition is, ought to be carried out before spring opens. Unfortunately, the number of persons who have the knowledge necessary for such an inspection is small, but probably enough can be found to direct and supervise such an inspection, if not to make it personally.

The speech of Mr. Ingalls at the Chicago meeting, April 1, seems to have been the one declaration of the purposes of the railroads there assembled, and of the methods which they purpose to follow. Purposes and methods appear to be precisely those of the Joint Executive Committee, except that the central office will be in the West instead of the East. For an association which extends no further east than Pittsburgh and Buffalo, this seems altogether proper, and it is probable that there is something to be gained by dealing with questions where they arise. Certainly it is always very difficult to get a general attendance of the principal railroad officers frequently a thousand miles or so from their homes.

But it is also true that this is a large question, and that it is not possible to eliminate the power and influence of the eastern railroad managers in treating it. Much the larger part of the traffic which the Chicago meeting proposed to deal with passes over railroads which are controlled by men in New York, Philadelphia, Baltimore and Montreal, and nothing can be done without their coöperation. The names of a few companies in the Joint Executive Committee may be omitted from the list of the Chicago association, but the power of nearly all but the two new trunk lines must be represented in it.

In many cases, the success or the reverse of any effort to maintain rates depends upon the earnestness with which the effort is made. Mr. Ingalls' speech indicates that the western roads have taken up the matter seriously and with a determination to succeed if possible, which is itself the most necessary condition of success. The official report indicates that there was not much interchange of opinion at the meeting, but all the proposals for coöperation were accepted so readily as to make it appear that all were ready to do anything which will enable them to get some profit on the vast business which they were beginning to carry for bare cost. The western companies must feel now that the responsibility is with them, and the consciousness that success will earn them great credit, as railroad managers ought to prompt them to make great exertions to secure it.

No one can complain that the low rates since February have not been attended with large shipments. The grain shipments from the eight reporting markets for the five weeks ending April 4, and for the corresponding weeks in eight years previous have been in bushels:

Year.	Bushels.	Year.	Bushels.
1877.....	5,166,931	1882.....	8,490,400
1878.....	13,103,882	1883.....	17,367,439
1879.....	11,847,018	1884.....	17,917,288
1880.....	18,702,556	1885.....	20,588,833
1881.....	10,327,909		

Thus the shipments this year were 15 per cent. more than last year, when the rates began higher but closed lower, and probably averaged lower than this year, and were larger than ever before, even 10 per cent. more than in 1880, when they were extraordinary. The rate this year was 20 cents, with some cutting, but averaging not much less; the rate in 1880 was 35 cents, and there was no complaint of cutting, and should not have been any occasion for any, as the roads had generally more freight than cars. At the regular rates, the shipments this year yielded about \$2,050,000 of gross earnings; in 1880 the smaller amount yielded \$3,272,000. Thus the railroads have suffered at least their full share of the fall in the price of grain, the charge having been reduced 43 per cent. and the profit 75 per cent.

But it is interesting to see that the grain movement has actually been large, which is not always the case when rates are low.

There are usually some signs in March of the course of immigration for the season, while the arrivals in the winter months have little significance. The immigration, however, never becomes really large until April. The arrivals in each of the first three months of the year have been for four years, and the aggregate arrivals for the three months have been for five years as follows:

	1881.	1882.	1883.	1884.	1885.
January.....	18,480	12,940	12,015	11,360	
February.....	28,247	17,065	15,862	7,461	
March.....	65,234	38,730	38,597	23,550	
Three months.....	80,356	111,970	68,735	66,474	42,180
Year.....	716,868	712,542	500,196	453,983	

The percentage of the year's immigration arriving in this first quarter of the year in successive years has been:

	1881.	1882.	1883.	1884.
	11.2	15.7	13.3	14.6

Should the proportion for the rest of the year be as large as in 1881, when it was largest, the arrivals in 1885 will be 376,600; should it be as small as in 1882, when it was smallest, the arrivals will be 268,700.

The cost of immigration is less now than ever before, the steamship lines having cut rates materially, while the Pennsylvania Railroad carries immigrants to Chicago, Cincinnati, etc., for a dollar, instead of the regular rate of \$13. It is said that many orders have been sold ahead for tickets at these rates, and it is probable the number of immigrants arriving this season will be, if it has not already been, somewhat increased by the very low fares. But it is not probable that the low fares will cause a large immigration, or prevent its being less than in previous years. There are always immigrants here who save money to bring over their relatives, and send for them about as soon as they have money enough, and of course they can bring them over when it costs \$15 much sooner than when it costs \$30 or \$35; but by far the larger num-

ber come because of a prospect of immediately getting steady work at good wages. The prospects for that are not nearly so good now as they have been in most other years since 1879, and cheap fares cannot tempt people to leave their homes when the prospect for making a living here is not good. But it is well to remember that at this time a comparatively slight difference in his wages for a few months will transport a workman from a European port to Chicago.

The Chicago Meeting.

The full report of the meeting of presidents, general managers and general freight agents of railroads west of the terminus of the eastern trunk lines, held in Chicago April 1, shows a very full attendance, in many cases three officers being present from a single railroad, large and small roads being represented, including those railroads west of Chicago whose coöperation is most needed in the maintenance of rates east of the Mississippi, as the Chicago & Alton, the Chicago, Rock Island & Pacific, the Chicago, Burlington & Quincy, the Chicago, Milwaukee & St. Paul, the Chicago & Northwestern, the Indiana, Bloomington & Western, the Wabash, the Hannibal & St. Joseph and the Missouri Pacific (which three latter can help greatly concerning Kansas City business, which has been a great source of trouble), the three roads from Detroit to Lake Michigan, which have or can have a share of the Milwaukee shipments; the Peoria, Decatur & Evansville; besides the lines east of Chicago and St. Louis, which have the greatest interest in maintaining trunk line rates. The "joint agents" of the several western pools formed by the Joint Executive Committee were also present, and Commissioner Midgley, of the Southwestern Association, and Commissioner Richardson, of the Chicago & Ohio River pool.

In most cases, too, the several companies were represented by leading officers; thus, Vice-President Seargeant was there for the Chicago & Grand Trunk, President Newell for the Lake Shore, Vice-President Orland Smith for the Baltimore & Ohio, President Peabody for the Ohio & Mississippi, Mr. D. S. Gray and Mr. Stewart for the Pennsylvania's lines, not to speak of Presidents Ingalls, of the Cincinnati, Indianapolis, St. Louis & Chicago, and Devereux, of Cleveland, Columbus, Cincinnati & Indianapolis, who seem to have been among the principal promoters of the meeting. This meeting not only had the full approbation of the eastern trunk lines, it should be remembered, but was called by Mr. Fink in pursuance of action at a meeting of the trunk line presidents March 23. This is important, because as the principal lines east of St. Louis and Chicago are directly or indirectly controlled by the eastern trunk lines, nothing can be done without their consent and coöperation.

The meeting was informed of the actual condition of rates at the several pooling points by reports made by the joint agents. Mr. H. S. Dewey, of the St. Louis pool, alone had a satisfactory report to make. His pool was in full working order, in accordance with the agreement of June 24 last; balances had been paid and freight diverted, in accordance with orders, and rates had been strictly maintained. The Vandalia Line, however, had given notice of withdrawal May 3, unless it should be given an allowance for traffic from points west of St. Louis which has been diverted from St. Louis (as it may be taken across the Mississippi at Louisiana, Hannibal or Quincy, and thence to some of the roads which are in the St. Louis pool), or unless the traffic from those points west of St. Louis and passing through St. Louis is eliminated from the pool. St. Louis has probably, on the whole, given less trouble than any other pooling point, though it gave a good deal in the early part of last year, and contributed much to the slaughter of rates from March 21 to June 21.

Joint Agent T. C. Moore reported of the Chicago pool that it was in a disorganized condition. Rates were not maintained; there were cuts of 2½, 3 and 5 cents per 100 lbs. on the low-class rates and some cutting of the higher classes. Some of the roads did and some did not bill at the cut rates. What rebates the latter were paying Mr. Moore could not tell.

Joint Agent W. A. Brubaker reported the Peoria pool in an unsatisfactory condition; the grain rate at the time was cut 3 cents per 100 lbs., "owing to the action of the Chicago roads and the practice of changing consignments en route." No balances had been settled. It was brought out by discussion, moreover, that the rate which was reported cut was itself an unauthorized rate. The Peoria rate, by the schedules agreed upon for differences in rates at different competing points, should be 110 per cent. of the Chicago rate, or 22 cents at the present 20-cent basis rate for grain. But after the railroads were permitted to make rates to suit themselves, the Peoria roads had apparently agreed to make their standard no higher than the Chicago standard, and the cut of 3 cents was from a rate of 20 cents. Freight was billed at 19 cents and a rebate of 2 cents paid.

Joint Agent M. L. Doherty, of the Indianapolis pool, reported that when the rate was made 30 cents from Chicago, the open rate at Indianapolis, which regularly would be 18½ cents, was made 18 cents, as there were some contracts out at that rate. This rate was cut about 2½ on the low classes. The Indianapolis Joint Committee was harmonious and was securing better rates than if each railroad acted independently.

Joint Agent C. W. Temple said the Cincinnati pool was not in a very satisfactory condition; the local rates made by the local committee had not been fully maintained.

Mention having been made of Seneca, where the Cincinnati, Indianapolis, St. Louis & Chicago connects with the Rock Island, and which has been a source of much trouble of late

months, Mr. Ingalls, President of the former company, made a long speech, which we give elsewhere, in which the only reference to Seneca business was that "we make the same rates as other people do." It was in this speech that Mr. Ingalls moved the appointment of a committee of 16 to report a plan of action, which the same day reported in favor of a division of traffic in the territory east of a line drawn through Milwaukee, Joliet, Seneca, Streator, Peoria, the Illinois and Mississippi rivers to St. Louis, north of the Ohio and west of the Eastern trunk lines, the appointment of a committee to prepare a plan for a Western Association, the continuance and reorganization of the old western pools, and the immediate restoration of rates to the 20-cent basis. These recommendations, which have been published heretofore, were all adopted with very little debate, there being, however, some question of the practicability of restoring rates as early as April 6, in view of the engagements made. The votes seem to have been unanimous, but the companies west of Chicago, members of the Southwestern Association, gave it to be understood that they should not be called upon to pool traffic in the new association which they had already pooled in the Southwestern Association. The resolution for the restoration of rates April 6 to the basis of 20 cents per 100 lbs. for 13th class (grain and flour) from Chicago to New York was voted for by every company represented.

The other chief event of the meeting was the speech of Mr. Devereux near its close, which has attracted general attention, and in which he deprecated the enormous losses attending investments of capital in American railroads, and proposed a committee to consider the laws affecting railroad construction and operation, and the changes in them which are desirable, and then to call a meeting in Philadelphia by the 4th of July next, to which shall be invited the several state railroad commissioners, the committees of Congress which consider transportation questions, the Chief of the Bureau of Statistics, representatives of the commercial interests of the principal cities and of labor and manufactures, to consider the recommendations made by the committee. Mr. Devereux's address we give in full elsewhere.

Thus the Chicago meeting not only proposed a new great coöperative organization for the maintenance of rates, including the larger part of the Joint Executive Committee, but also suggested legislation for the permanent protection of the railroads—an appeal to the community for assistance in preventing the destruction of the value of railroad investments.

The Coal Premiums on the Pennsylvania Railroad.

We have heretofore described briefly the Pennsylvania Railroad's system of paying premiums for coal-saving, but the subject is so important that the following more detailed account of the method followed will, we believe, be found useful.

As a result of many experiments, a limit is declared of the coal required for a given train over a given run. If this limit is not reached the balance is considered as saved—one half going to the railroad company and the other half being equally divided between the engineman and fireman. If the limit is passed, the attention of the men is called to the fact, and they are expected to show a better performance in the future or give a satisfactory explanation of their failure.

The details of the system are as follows:

Engines are coaled at certain stations, each one of which is in charge of a foreman.

Upon the arrival of an engine at the end of its trip, the foreman takes the coal remaining in the tender to a level, and estimates its weight by means of marks on the side of the tank. Every foreman has a set of standard blanks, on which are calculated the number of pounds to the inch in depth for every class of engine. The coal remaining in the tank at the end of the trip is subtracted from the amount taken on for use on that trip, and is added to the amount taken on for the next trip.

Engines are coaled in different ways.

In some cases the coal is weighed in the barrows immediately before it is put on to the tender. At other places, each barrow having been carefully weighed, an average of several loads is taken and used as the constant weight of that barrow. The first-mentioned method is, of course, preferred as being always right; but it is not always convenient or possible.

A book containing slips like this is kept on every engine and is used in the following manner:

M. P. 38.	M. P. 38.
Engine No.	Engine No.
Engineman	Engineman
Fireman	Fireman
Am't coal on tender, charge .....	..... Station.
Harrisburg .....	..... 188
Milfersburg .....	..... 188
Sunbury .....	..... 188
Watsonstown	Coal
Williamsport .....	..... Pds.
Lock Haven	Wood
Renovo .....	..... 16th Cords.
Amount coal left on tender, credit .....	.....
Helped engine .....	.....
Loaded .....	.....
From .....	.....
From .....	.....
M. P. 38.	M. P. 38.
Engine No.	Engine No.
..... Station.	..... Station.
..... 183	..... 188
Coal	Coal
..... Pds.	..... Pds.
Wood	Wood
..... 16th Cords.	..... 16th Cords.
..... Engineman.	..... Engineman.

The coal remaining on the tender from the last trip is put on the first line; "Am't coal on tender, charge."

Then, at every place where the engine takes coal the amount taken on is set opposite the name of the station, and the engineer fills out one of the coupons attached to the stub, signs it, and gives it to the foreman of the station, who forwards it to the store-keeper of the division. At the end of the trip the engineman fills up the stub, adding to it the amount of coal left on the tender, and forwards it to the Premium Clerk. It should be mentioned that the coupons serve as a check both on the engineman and on the foreman of the coaling station.

There are three amounts necessary for arriving at the quantity of coal saved: The car mileage of the train which the engine pulled, the limit established for that train, and the number of pounds of coal burned by the engine.

Before going further, word should be said of the "limit."

The limit is the number of pounds of coal per car-mile which it is permitted to an engine to burn. Great care is taken in deciding upon it, and it is changed every month for all trains. It is also closely watched by the Premium Clerk, and the performances of the several enginemen on the same train are compared frequently with former records of the same month, so that if the limit for a certain train is found too easy it is reduced.

Of the amounts mentioned above as necessary for arriving at the coal saved, the Premium Clerk derives the car mileage from the Car Record Office, which sends him a record of every train on his division; the limit is furnished him by the Division Superintendent, and the coal burned by the engine he gets from the stub sent him by the engineman at the end of every trip.

The calculation performed by the Premium Clerk is short and simple.

It will be seen that the amount of coal taken on at all stations by an engine during a certain trip, plus the amount remaining in the tender from the previous trip, minus the amount left in the tender at the end of the trip, will equal the coal burned; so that if an engine had 1,950 lbs. on arriving at Harrisburg and took on 11,000 lbs. more in preparation for the next run, and the engineman, finding his coal getting low on returning to Renovo, took 4,000 lbs. more at Watsonstown, having 3,600 lbs. left on arriving at Renovo, his engine would have burned 13,350 lbs.

Suppose that the limit for a certain train for March is 3.1 lbs. of coal per car-mile, and that the train made 4,603.5 car-miles from Harrisburg to Renovo—then, $4,603.5 \times 3.1 = 14,270$, the number of pounds which the engine might burn without exceeding the limit. But only 13,350 lbs. were burned, therefore $14,270 - 13,350 = 920$, the total amount of coal saved. The engineman and fireman each getting one-fourth of the total, which is 230 lbs., that sum is put down in a column under each name, to be footed up at the end of the month. The price paid the men for coal accredited to them is the same as is paid by the company at the mines, and is paid to them on the same check with their time.

In case one of the men should leave an engine before completing the trip, his premium is figured proportionally for the distance run by him.

Men running on regular trains only have their stubs figured for a premium. Yard enginemen and work train enginemen cannot get a premium.

Complete lists of all men who run on regular trains are placed on the bulletin board at the end of every month, showing the amount of coal saved or the excess charged to them.

This system is now fairly established on many divisions of the Pennsylvania Railroad, and is being organized on several others. It is considered by most superintendents a valuable mode of effecting economy.

There are many lesser points connected with this system not noticed in this article; but the most important features are, it is believed, here set down.

American Locomotives at International Exhibitions.

It is a matter of regret that the American locomotive has not been adequately represented in the numerous international exhibitions recently held in Europe. If we are to increase our export trade in locomotives, as the first step in such a direction it is necessary to show other nations what we have to sell. The Exhibition of Inventions held in London this year, and the American Exhibition which is to be held in the same place next year, are both good opportunities for American manufacturers to extend their trade, and we understand that at least one firm of American locomotive builders contemplate exhibiting a sample of their work at the latter exhibition.

We have made some inquiries of a trustworthy authority as to which style of American locomotive would be most likely to find a sale at these exhibitions. The substance of the reply received is given below.

Any Locomotive Superintendent would hesitate to have an engine which, in all its equipments, differed from the other engines running on his line, the cost of repairs being enhanced by the lack of tools, gauges and repair parts specially suited to the American engine. Owing to this and another cause, which will be mentioned further on, the "Lovett Eames," an engine built to run on the Bound Brook route, and afterward taken to Europe to demonstrate the working of the Eames vacuum brake, found a purchaser with difficulty, and at a reduced price.

This engine also labored under a greater disadvantage. The smoke-stack was too high, and the cab, etc., too wide to clear the tunnels and bridges. The usual limits in Europe of breadth and height of locomotives are shown in the engine which we illustrate in this week's issue. The top of the smoke-stack is only 12 ft. 11 in. from the rail level, and the extreme

breadth at any point is only 8 ft. 4 in., both these dimensions being smaller than are permissible here. The usual arrangement of side buffers is also shown. They are universally placed 5 ft. 8 in. apart centre to centre, and at a height of 3 ft. 4 in. to 3 ft. 6 in. from the rail level when the engine is in working trim. The bumper-beam should be stiffened in their wake so as to transmit any buffing shocks to the main frame without injury or deformation.

A heavy Mogul, with 19-in. cylinders and 58 or 60-in. wheels, would appear to be the most suitable class of engine, as it would be better adapted to run the fast freight trains usual in Europe than a more powerful consolidation with smaller wheels. As heavier rails are used on the other side of the Atlantic, there is little objection to loading driving wheels up to 32,000 lbs. per axle, and therefore the weight placed here on the four driving axles of a Consolidation might there be placed on the three driving axles of a Mogul.

As anthracite is virtually never used outside this country, the engine should be a soft-coal burner, and if fitted with a shaking grate, that feature would be likely to find favor in the eyes of a purchaser from Belgium or North Germany, where the coal is generally full of dirt.

Pumps have been for many years abandoned throughout Europe, and, therefore, it would be well to fit the engine with injectors exclusively. The cost of bell and pilot might be saved, but the headlight might very possibly be found useful and become a favorite. Driving-wheel brakes are much used in Europe, and it is considered imperative that a strong, well-fitted hand-brake be applied to all the wheels of the tender.

Strap-end side rods are never used in Europe, and an engine fitted with them would be considered to possess a very undesirable feature.

Though the trials of steel fire-boxes in Europe have generally ended in failure, there exists a strong wish to test an American steel fire-box, and ascertain whether the water or the steel or the manner of firing is in fault. It is probable, therefore, that the fact of an engine exhibited having a steel rather than a copper box, would recommend her to a possible purchaser.

The extended smoke arch is unknown in Europe except by report, but its good results would render a trial very desirable.

A well finished, strongly built American engine, conforming to the points indicated, and having ample bearing and wearing surfaces, would, we believe, create not only a great deal of interest on the other side, but might also lead to some further interchange of commodities and ideas.

Chicago through shipments of flour, grain and provisions made a further increase last week, and became larger than in any other week of this year and were exceeded only about this time last year, and in the fourth week of March, 1880. The shipments of flour, grain and provisions this year and last, and of all freights in the corresponding weeks of four previous years, have been, in tons:

	1880.	1881.	1882.	1883.	1884.	1885.
Flour.....	56,429	53,020	38,988	36,271	97,653	83,098

Thus the shipments this year were 15 per cent. less than last year, when they were the largest ever known, but were very much larger than in any previous year. The rate received was certainly more than last year, but probably not many of the shipments reported were at the full 20-cent rate which it had been agreed to maintain strictly, beginning with last week; as previous experience indicates that most of the shipments reported the first week of an advance are of freight engaged at the old rates, and it is not probable that an advance in the rates actually received would be followed by an increase in the shipments, especially at this season, when the opening of lake navigation is close at hand. There has been reason, however, for hastening shipments recently. The storage rates in Chicago are so much for 10 days after April 15, while until then after navigation closes the time is not counted. Thus the holding of grain now increases storage charges, which earlier in the season was not the case.

The total shipments of flour, grain and provisions in each of the last six weeks, and the percentage of the total going by each railroad, have been:

Tons:	Mich 7.	Mich 14.	Mich 21.	Mich 28.	Apr. 4.	Apr. 11.
Flour.....	17,153	23,600	23,753	20,236	22,267	22,108
Grain.....	36,354	38,080	47,087	44,805	46,894	54,188
Provisions...	7,474	7,086	5,134	6,041	5,948	6,793
Total.....	56,981	68,765	75,974	71,082	75,109	83,089
Per cent:						
C. & Grand T.	10.2	8.2	7.0	9.8	19.2	15.6
Mich. Cen.	8.1	14.3	24.6	25.7	27.4	20.9
Lake Shore...	17.0	17.1	11.8	6.8	4.6	5.6
Nickel Plate...	5.1	7.2	8.9	11.3	9.4	9.3
Ft. Wayne...	24.0	20.2	19.3	21.1	19.8	18.7
C. St. L. & P.	14.6	10.2	11.7	14.4	12.5	16.8
Balt. & Ohio...	7.3	11.1	7.2	7.2	5.3	6.6
C. & Atlantic.	13.7	11.7	9.5	3.7	1.8	6.5
Total.....	100.0	100.0	100.0	100.0	100.0	100.0

The increase last week was 15½ per cent. in grain and 14 per cent. in provisions, while there was a decrease in flour.

The percentages do not show such extremes last week as the week before, the Michigan Central falling back and the Chicago & Atlantic advancing, but the Lake Shore carried less than any other road, and the Chicago, St. Louis & Pittsburgh had an unusually large share.

The Chicago & Grand Trunk carried more flour than any other road last week (24½ per cent. of the whole), followed by the Fort Wayne and the Michigan Central, the three taking two-thirds of the whole. The two Pennsylvania roads carried more than half of the provisions. The great gain of the Chicago, St. Louis & Pittsburgh, however, was in grain, 18 per cent. of which went by it, while 16½ per cent. went by the Fort Wayne and 22½ by the Michigan Central.

The advance of rates declared for April 6 should be felt, if it was really enforced, on the shipments of the current week;

but large shipments are entirely possible at a 20-cent rate, though there will probably be but two more weeks before navigation is open. The stock of wheat in the Chicago elevators is larger than ever before, and there is also a very large stock at Milwaukee and at Duluth. Little, if any, of the latter is likely to be forwarded by rail, but it will require a good many vessels, which otherwise would be competing for the shipments from Lake Michigan ports, and reducing the amount the railroads could secure there.

It is noticeable that though there was a large increase (\$344,264) in the total earnings of the Chicago, Burlington & Quincy Railroad last January, compared with the previous year, and a large decrease (\$369,098) in February, there was a decrease in passenger earnings in both months, which was but little greater in February than in January, in spite of the snow blockade (\$62,355 in February and \$52,759 in January). The great change was in freight earnings, which were:

	1885.	1884.	Inc. or Dec.	P. c.
January.....	\$1,527,760	\$1,178,943	+\$348,817	29.6
February.....	1,179,106	1,505,235	- 326,129	21.7

Two months... \$2,706,866 \$2,684,178 + \$22,688 0.8
Thus for the two months the freight earnings were very nearly the same in both years, and the months simply changed places. The bad month was January last year and February this year.

Record of New Railroad Construction.

Information of the laying of track on new railroads in the current year is given in the present number of the *Railroad Gazette* as follows:

Kansas City, Clinton & Springfield.—Track laid from Raymore, Mo., southeast 5 miles.

Kansas & Gulf Short Line.—Extended from Forest, Tex., southeast 7 miles. Gauge, 3 ft.

Memphis, Selma & Brunswick.—Track laid to a point fourteen miles from Memphis, Tenn., an extension of 8 miles.

This is a total of 20 miles, making 275 miles thus far reported for the current year. The new track reported to the corresponding date for 14 years past has been:

	Miles.		Miles
1875.....	275	1878.....	267
1876.....	466	1879.....	267
1877.....	911	1880.....	358
1878.....	1,772	1881.....	196
1879.....	819	1882.....	324
1880.....	996	1883.....	566
1881.....	391	1884.....	698

This statement covers main track only, second tracks and sidings not being included.

NEW PUBLICATIONS.

Report of New York State Survey for 1884. James T. Gardiner, Director.

The report for the present year is mainly confined to defending the work of the past, no field work and nothing beyond a few office computations having been done in the past year, for lack of appropriations. Some interesting details of the cost and accuracy of such work are given, however. The mean error in closing 200 triangles was 2.02 seconds, the probable error in one observed angle having been a fraction over ¼ second, which is fully up to the Coast Survey standard, and that of other surveys of states. The cost of triangulation, so far, has been \$9.80 per square mile, the United States Lake Survey and parts of the Coast Survey having cost \$15, and the Prussian State Survey \$18. It is urged that the state proceed with a thorough topographical survey of the entire state at an estimated cost of \$500,000, or \$15 per square mile as an average (outside of triangulation work), the cost varying from \$10 to \$20 according to the locality. This estimate is based on the experience of Massachusetts and New Jersey, where such surveys are now in progress, and of New Hampshire, which has completed one at less cost than \$15 per square mile. Cheaper government surveys in the Far West, at \$3 to \$5 per square mile, are said to be now proving inadequate, and are, at points, being made over.

TRADE CATALOGUES.

Light Locomotives: H. K. Porter & Co., Pittsburg, Pa. Fifth edition, 1885.

This catalogue contains a great deal of useful information as to the choice of locomotives for narrow-gauge, logging, mining and other services demanding small or specially constructed locomotives.

A large portion of the book is devoted to a clearly tabulated record of work done by different locomotives of Messrs. Porter's make. The figures are, it is stated, chiefly taken from reports furnished by the owners. The book states: "Our intention in presenting these reports is to give practical information based on actual facts, instead of on theoretical calculations as to the power, speed, daily mileage and consumption of fuel and water of our locomotives; and as to the grades and curves, the gauges of track, weight of rails and efficiency of different classes of roads on which light locomotives can be used advantageously. We have placed these reports in tabular form, grouping together similar locomotives arranged according to the sizes of cylinders and steepness of the grades."

An intending user can thus form an excellent idea of what locomotive he wants to perform any given service, and the practical value of such a collection of tabulated actual performances is very great.

The book, besides illustrating and briefly describing the numerous classes of engines built, gives many valuable data on points in which the users of small engines are likely to be interested—the detailed cost of a mile of track laid with

different weights of rails, the weight of cars, spikes, lumber, etc.

Wooden railroads, light railroads, logging roads, extensions of street car lines, plantation railroad, locomotives for steel works, the use of locomotives inside mines, and many other subjects, are briefly treated from a highly practical point of view, and the data and suggestions given are doubtless the fruit of a great deal of practical experience.

Apart from its merits as a catalogue pure and simple, this little book contains much practical information that cannot be found in more ambitious works professedly written to elucidate similar subjects.

Foreign Railroad Notes.

In Europe as well as America railroad earnings fell off last year. In Austria and Hungary there was generally some increase in passenger earnings, but a decrease of about 4 per cent. in freight earnings.

In Austria 639 miles of new railroad were opened in 1884 and in Hungary 190½ miles, or 835½ miles in all, which is the greatest amount for many years. The area of the twin monarchies is about equal to that part of the United States north of the Potomac and the Ohio, and east of Illinois and Lake Michigan, and the population is equal to two-thirds of that of the whole United States. This makes the total length of railroad in Austria-Hungary 13,630 miles, giving one mile of railroad to 2,776 inhabitants and 16.6 square miles of area.

In Italy for some years there has been a rage for tramways, serving as light railroads around towns, usually worked by locomotives, and carrying freight as well as passengers. Hundreds of miles of them were built, and they seemed successful and were certainly popular. The charters, with the right to use the highways, were granted by the towns and provinces, but the tramways were built, largely at least, by companies. Last year there were 1,053 miles of such steam tramways; 100 miles had been completed within a year, and 282 were under construction. They seemed to have met the national demand for something better than a turnpike on routes which would not support a railroad.

Recently several of these companies have failed. One of the roads has been abandoned and the rails taken up because it did not earn its expenses, and the *Railroad Monitor* of Milan, says that with few exceptions they will all sooner or later become bankrupt, the traffic being too light to support them, and consisting more of excursionists, than necessary travel or freight.

It seems strange that it should have taken so long for this to become known, and perhaps the *Monitor's* condemnation is too sweeping.

Russia is about to begin a second railroad between the Black Sea and the Caspian, along the foot of the Caucasus on the north, while the existing railroad (Poti to Baku) is south of the mountains. The new road will give an outlet to an extensive and fertile country, now reached only by a railroad from the mouth of the Don southward to the foot of the mountain at Vladikaukas, about half-way between the two seas, which railroad is generally about 150 miles north-east of the Black Sea, and has no branches. The part of the new railroad to be built first will extend from the Vladikaukas line some 175 miles northwest of that place, nearly due west to the Black Sea, at Novorissik, a little east of the outlet of the Azof Sea, where is a harbor that never freezes, as the Azof ports do. This part of the railroad will be 173 miles long. The western part will cross some very difficult country, but is expected to afford a considerable traffic, as it (near the Black Sea) has extensive petroleum fields, said to be very promising. These must not be confounded with the Caspian petroleum springs about Baku, which are 400 or 500 miles further southeast. This part of the railroad is to be completed within two years. Like other Russian railroads, it will be of 5 ft. gauge. The cost, with harbor improvements at Novorissik, is estimated at \$9,500,000, or \$55,000 per mile. The line will affect our traffic to some extent by giving an outlet to a productive grain country as well as to petroleum. The latter does not depend upon it wholly, as there is now a pipe line 60 miles long leading from the wells to Novorissik.

The eastern section of the road, extending to the Caspian at Petrosk, will be somewhat longer, and may not be begun until the other part is completed. When built it will be possible to ride by rail all the way from the Atlantic to the Caspian Sea. The existing road from the Black Sea to the Caspian does not connect with any other railroad, the great range of the Caucasus separating it from the Russian and European system.

TECHNICAL.

Locomotive Building.

The Rogers Locomotive Works, in Paterson, N. J., recently delivered a new anthracite-burning passenger engine to the New Jersey & New York road.

The Taunton Locomotive Works, in Taunton, Mass., have just delivered two new engines to the Seaboard & Roanoke road.

The Brooks Locomotive Works, in Dunkirk, N. Y., last week delivered two new engines with 17 by 24 in. cylinders to the Indiana, Illinois & Iowa road.

The Car Shops.

The Jackson & Sharp Co. in Wilmington, Del., is building 8 passenger and 2 combination cars for the Illinois Central; two passenger cars for the Augusta, Gibson & Sandersville, and two for the New York, Philadelphia & Norfolk, besides other work.

The Pullman Car Works at Pullman, Ill., have completed

20 new passenger cars for the West Shore road. They are similar to those already in use on the road. They are also building several passenger cars for the Fitchburg road, and 250 box cars for the Chicago, Burlington & Quincy.

The Old Colony shops in Boston are building several passenger cars and 50 box cars for the road.

The Barney & Smith Manufacturing Co. in Dayton, O., has just completed a car for the use of President Ingalls, of the Cincinnati, Indianapolis, St. Louis & Chicago. It is intended for use, and while it is well finished and comfortable, has no superfluous ornament. It is mounted on six-wheel trucks and is 55 ft. long and the ordinary width and height. In one end is an observation room, in the centre are two bedrooms, and in the other end a dining-room, a smoking-room and a kitchen.

Bridge Notes.

The King Iron Bridge & Manufacturing Co., in Cleveland, O., has taken a contract from the New York, Lake Erie & Western Co. to build an iron riveted truss deck bridge over Scranton avenue in Cleveland, on the line of the leased New York, Pennsylvania & Ohio road. The bridge is to be finished by May 15.

The Philadelphia Bridge Works of Cofrode & Saylor, in Pottstown, Pa., have taken a large contract for structural iron work for the new steel works at Pottstown.

Iron and Steel.

Franklin Furnace, in Sussex County, N. J., has started on the fourth year of its present blast.

The rolling mill of the Pottstown Iron Co., in Pottstown, Pa., resumed work March 30.

It is said that Callie Furnace in Botetourt County, Va., is to be taken down and removed to some point on either the Chesapeake & Ohio or the Richmond & Allegheny road. The furnace has been idle for some time, and the change is to be made in order to secure fuel at less cost than it can be had in the present location.

The New Albany Rolling Mill, in New Albany, Ind., has resumed work making rails.

The Edgar Thomson Steel Works at Braddock, Pa., are now running to their full capacity on steel rails and turning out an average of 450 tons a day.

The Pittsburgh Steel Casting Co. is now making about 300 car axles a day, and has several large orders to fill. The works are very busy.

Manufacturing and Business.

The Pennsylvania Steel Co., at Steelton, Pa., is running its frog, switch and signal department to its full capacity, having already a large number of orders, both large and small; on hand, while others are constantly coming in.

The Rohan Brothers' Manufacturing Co., in St. Louis, is making an iron cylinder 110 ft. long and 6 in. diameter, of $\frac{1}{2}$ -in. iron, for the Las Vegas Wood Preserving Co., at Las Vegas, N. M. The cylinder is to be used in the process of creosoting timber.

The Rail Market.

Steel Rails.—Quotations are from \$27@27.50 per ton at mill, small lots being generally placed at the higher figure. Large buyers are reported holding off for lower prices, but the mills are fairly supplied.

Rail Fastenings.—Quotations continue entirely nominal at 1.90@2 cents per pound in Pittsburgh for spikes; 2.25@2.60 for track-bolts, and 1.65@1.75 for splice-bars. Few sales are reported.

Old Rails.—Old iron rails are quoted steady at \$17.50@18 per ton at tide-water, with few sales, but holders unwilling to quote lower. Old steel rails are firm at \$17@18 per ton at Pittsburgh, with several sales.

Railroads in Nicaragua.

Surveys are now in progress for the Central Division of the National Railroad of Nicaragua, and the contracts for its construction will be let about May 15. This division will be about 40 miles long, and will, with the line of 100 miles already under construction, complete a railroad from the Atlantic coast to Lake Nicaragua.

Test of Rotary Steam Snow-Shovel.

The Rotary Steam Snow-Shovel, which was described and illustrated in the *Railroad Gazette* of Sept. 12, 1884, was tried in a snow bank near Buffalo on April 2d and 4th. The site chosen was near the lake, and consequently frozen spray, sand, and even some logs of timber were embedded in the snow, and contributed to form an unusually hard snow bank. The machine, however, cut a path through the compact mass of snow and ice, and it is stated, threw the snow over a trestle 32 ft. high, and to a distance horizontally of 292 ft. This seems almost incredible, but is vouched for by reputable witnesses who measured the distance with a tape line. A large number of railroad men witnessed the tests, and many of them expressed themselves as much pleased at the results of the experiment, which certainly appear to show that the machine can effectively clear any snow blockade. The essential and valuable feature of the machine is that it not only removes the snow from the track, but throws it to a such a distance that the snow cannot again roll back on the track after the train has passed.

Engineers' Club of Philadelphia.

A regular meeting of the Club was held in Philadelphia April 4, President J. J. de Kinder in the chair; 46 members and 4 visitors present.

The Secretary presented for Mr. Jacob H. Yocum an illustrated description of the recently constructed water-works at Columbus, Ga., intended to supply a population of 25,000.

The discussion on strengthening the west main abutment of the Chestnut Street Bridge was continued by Mr. C. C. Darach, Mr. Rudolph Hering, and Prof. L. M. Haupt, a number of other members also joining in briefly.

The Secretary announced the death of the venerable Col. James Worrall, member of the Club, and the Club then adjourned.

A Drawbridge Danger.

An instance of the occasional circumstances which call for care by the engineers of railroads is that of a drawbridge of one of our railroads which requires a clamp of extra strength to hold it in position when the bridge is closed. The road approaches the bridge by a curve and the centrifugal force of the train pressing outward from the centre of the curve as it strikes the bridge, deflects the bridge on its axis and in time warps and twists the clamp designed to hold it in place. It is found necessary to renew this clamp from time to time, as it is liable to become so warped as to hold the bridge when closed in such a position that the rails do not meet at all.—*Toledo (O.) Commercial Telegram*.

Proposed Tunnel Under Northumberland Straits.

A bill has been presented in the Canadian Parliament providing for a connection between Prince Edward Island and the main land by a tunnel under Northumberland Straits. The total distance from Cape Tormentine to Cape Traverse, the two terminal points, is $8\frac{1}{2}$ miles. The author of the bill proposes to run a tunnel composed of cylinders 15 ft. in diameter,

made of $\frac{3}{4}$ -in. iron lined with concrete $2\frac{1}{2}$ ft. thick, giving a clear passage way of 10 ft., through which cars may be drawn by a fireless engine. It is also proposed to run trestle work out from the main land on the New Brunswick side 10,000 ft., and from Prince Edward Island side 4,000 ft., which will connect at each end with the metal cylinder to be laid across the bottom of the straits. To reach the bottom of the straits, which, at the end of the piers is 20 ft. below water level, the cylinder will run down a gradual decline. Ventilation will be secured from a shaft sunk about half way across the straits, at which point the water is 90 ft. deep. The minimum current is about one knot; even during the heaviest gales it does not exceed four knots per hour. The total cost is estimated at \$2,000,000.

A Big Load.

Messrs. Cammell & Co., of Sheffield, recently completed an immense propeller for a steamship, which is being constructed at Belfast. The blades of the propeller—one of the largest yet made—were so wide that they overlapped the opposite line of rails to that on which the propeller was being transported. On Sunday arrangements were made for the conveyance of the propeller, and in order to effect this the passenger trains along the route were side-tracked to allow the special train to pass. At the stations and junctions the propeller excited great interest.—*The Engineer*.

Machine Tunneling Through Rock.

Col. Beaumont's tunneling machine, which cuts a circular heading somewhat over 7 ft. in diameter, has been very successfully used on the tunnel under the Mersey. The distance accomplished in the last week reported, through the red sandstone under the Mersey, was 261 ft. or 43.5 ft. per working day, which remarkable performance is the "fastest on record." The heading now being driven, and which is nearly completed, has a total length of about 2,850 ft., and this, as well as the previous heading of about 2,100 ft. in length, is intended for effecting the ventilation of the main tunnel. The total distance driven by the machine in the Mersey tunnel is about 6,750 ft., including work on the drainage and ventilation headings.

Blast Furnaces of the United States.

The *Iron Age* says: "Our usual quarterly report of the condition of the blast furnaces of the United States is practically complete. Of the charcoal furnaces four are missing, but these are of little moment, being located in Minnesota, Utah, Texas and Oregon—one in each. From the anthracite the three spiegel furnaces in New Jersey are lacking. With these exceptions the statement is complete."

"In a condensed form the table makes the following showing as to the condition of the furnaces on April 1, 1884:

—In blast.—			—Out of blast.—		
Fuel.	No.	Weekly capacity.	No.	Weekly capacity.	
Charcoal.....	46	7,481	180	16,967	
Anthracite.....	82	21,704	138	31,540	
Bituminous.....	90	45,655	132	45,512	
Total.....	220	74,840	450	94,019	

"As will be seen from the following statement (for Jan. 1), there has been quite a falling off in the number of furnaces in blast since Jan. 1:

—In blast.—			—Out of blast.—		
Fuel.	No.	Weekly capacity.	No.	Weekly capacity.	
Charcoal.....	68	8,371	159	15,941	
Anthracite.....	86	21,564	135	28,500	
Bituminous.....	82	36,812	141	55,812	
Total.....	236	66,747	435	100,253	

"It will be noted that the falling off of furnaces in blast is chiefly among those using charcoal as fuel, 20 less being in blast April 1 than Jan. 1. Four less anthracite are in blast, but eight more bituminous. The capacity of the anthracite furnaces in blast April 1 is, however, about the same as Jan. 1, while that of the bituminous is nearly 9,000 tons per week greater. It is intimated that stocks of coke iron are increasing in the West, as they doubtless would under the increased capacity."

"As compared with a year ago, however, there is a decided falling off, not only of furnaces in blast, but of capacity as well. Considering only those in blast, the comparison is as follows:

—1884.—			—1885.—		
Fuel.	No.	Weekly capacity.	No.	Weekly capacity.	
Charcoal.....	62	8,713	48	8,481	
Anthracite.....	107	27,612	82	21,704	
Bituminous.....	100	49,236	90	45,655	
Total.....	269	85,561	220	74,840	

"This indicates a falling off of about 5,000 tons a week in the make of anthracite iron and 3,500 tons of bituminous iron."

"The number of furnaces in and out of blast on April 1 of each year since 1877 is as follows:

	In.	Out.		In.	Out.
1877.....	218	488	1882.....	457	281
1878.....	252	458	1883.....	375	334
1879.....	241	463	1884.....	269	432
1880.....	431	260	1885.....	220	450
1881.....	453	276			

"The number of furnaces now in blast is less than in any year since 1877."

THE SCRAP HEAP.

A Lady's Reading of a Cross-Section Drawing.

People who undertake to lecture on mechanical subjects to a mixed audience ought to avoid the use of cross-section drawings to illustrate their discourse; or, if they are used, very clear explanations should be given. The writer lectured the other evening on the "Locomotive" to a mixed audience in the Young Men's Christian Association rooms in the Grand Central Depot, New York, and a half-size cross-section of the Underhill locomotive boiler was used to show plainly what a multi-tubular boiler is. The explanations were duly given, and supposed to have been satisfactory. At the finish of the lecture the people were lingering round the room, talking and looking at the illustrations. A lady was examining the Underhill boiler drawing with great attention, and her escort asked what she was looking at. She explained that she was trying to understand the drawing. He asked what she made of it. "It looks to me," she said, "like a square with a great many tracks running from one side of it and a small house on the other side." The fire-box was the square, the tubes were tracks, and she imagined that the dome represented a house.—*American Machinist*.

Left Behind.

Shortly after the departure of the morning trains at the Union depot yesterday, a porter, who was working about in the ladies' waiting-room, found a chip basket, neatly covered with white cloth, which appeared to have no owner. On examining it he found it contained a boy baby about two months old. The "find" was called to the attention of the police, and the waif was sent to St. Ann's Asylum. The child is believed to have been abandoned by its mother.—*St. Louis Republican*, April 12.

Singular Tenacity of Life.

"How little it takes sometimes to kill a man, and then, again, what wonderful tenacity to life some men have," said the red-headed man, who was reading the paper.

"That's so," said the others.

"Just listen," said the red-headed man. "Here's a brakeman on the Nickel Plate road. The paper says: 'He fell in front of the car, which passed diagonally across his body, and lived—'"

"Begosh! I knew a painter who fell off a church steeple, and got well again," said the cross-eyed man.

"I knowed a man shot a bullet through his heart, and lived ten years," said the man who looked like a farmer.

"There was a man in Salem, where I come from, that had four ton of rock fall on him, and he's alive yet," said the one-armed man.

"Y-a-a-s," said the red-headed man. "Lemme see. Where was I? Oh—I fell in front of the car, which passed diagonally across his body, and lived but a few moments."—*Pittsburgh Chronicle-Telegraph*.

In the Sleeping Car.

"One of the funniest cases I ever ran across," continued the porter, "occurred this winter with a newly-married couple on their wedding trip. He was a young army or navy officer, I don't know which. His wife was a bashful, blue-eyed little girl, not a day over seventeen years old. About 11 o'clock at night I saw her stick her head out of the curtains and look up and down the aisles to see if the coast was clear. Then she slid out and pattered up to the water-cooler after a drink. When she started back she forgot her berth, and her bashfulness only made it worse. She got back to what she supposed was her berth and piled in. Well, I heard a swear and a scream, and then the little woman, frightened half to death, shot out of the curtains and up the aisle to the state-room, where I met her. You see she had climbed in with an old gentleman and lady from down in Texas, whose berth was next to hers. The old man was a cattle dealer and a rough old fellow, and his wife was a nervous, fidgety old lady. She just screamed and yelled 'Thieves! murder!' till every passenger in the car had his head out of the curtains. The young husband had been woke up and missed his wife, and he was almost wild, and came running up the car to where his wife was crying in the state-room. She just fell in his arms and pretty near fainted. He couldn't understand what had happened, and wanted to go back after his revolver and shoot some one. I just locked them in the state-room and then went back and explained matters to the Texas pair and got them quieted down. Then I told the other passengers that there was nothing the matter, and they pulled in their heads. The young fellow and his wife would not go back to their berth for about an hour until they were sure every one had gone to sleep. I managed everything so that no one but the old couple ever knew anything about it, or who it was that raised the disturbance. When they left the car the next day he slipped \$10 in my hand. Their names! Oh, no! I couldn't give you that."

"I had another experience, though, that floored me once. There is a pretty little black-eyed boy who lives over in Allegheny, who first saw the light of this world in the Pullman car of which I was porter. The boy is about three years old now, and he and his mother and father went down over the road with me this winter on their way to New Orleans."—*Pittsburgh Dispatch*.

The Cheapside Collision.

The Massachusetts Railroad Commissioners have made the following decision as the result of their investigation of a recent accident:

Collision of Connecticut River and Fitchburg railroad cars at Cheapside Crossing, east of Greenfield.

Fitchburg freight train 29, coming east, reached the crossing at 9:23 p. m., stopped in accordance with law, and then went on, the signal (two red lanterns at masthead) giving it the right of way.

The Connecticut River Railroad passenger train going north made its stop, and then went on in spite of the signal, which forbade its doing so. Its engine struck the engine of the freight train, fortunately doing little damage. The Connecticut River engineer admits that he and he alone is blameable, and gives as a reason that his attention was distracted so that he did not look for the signal. He has held his place with credit for 13 years, and had never met with an accident before.

This emphasizes the danger of such crossings, and reminds railroad managers that the best of men are liable to err. Even a system of interlocking signals and switches cannot insure attention to a signal.

This crossing is peculiarly dangerous; so much so that in 1879 a special act was procured by the two companies, aided by the Board, authorizing a separation of grades. And in 1881, after a general act applying to all such cases had been passed, the Board addressed the following letter to the two corporations:

"The Board of Railroad Commissioners would suggest that the recent destruction of the railroad bridge over Deerfield River, making it necessary to rebuild, affords an opportunity to do away with a dangerous grade crossing near the river. Our attention has been called to the subject by citizens of Greenfield, but it had already been discussed by the members of the Board. We would recommend that the two corporations, acting under chap. 120 of the acts of 1881, shall separate the grades of their roads at the point of intersection in Deerfield, thus promoting the safety of travellers on both roads."

The suggestion was renewed at the hearing on April 4, and the Board hopes that the joint examination of the premises which is to be made by the representatives of both companies will result in the removal of the danger.

We take pleasure in calling attention to the conduct of Edward L. Bemis, the Fitchburg engineer, who after falling between the tender and engine, got on again and stopped the engine. His courage and presence of mind deserve high praise.

A Fatal Signal.

Brakeman A. N. Enyart, on the Chicago, St. Louis & Pittsburg road, met his death in a singular way, at Winamac, Ind., on Monday night of last week. The train was doing some switching at that station, and he stood on top of a car to signal the engineer. He slipped and fell from the car, and as he fell, involuntarily swung his lantern in such a way that the engineer took it for a signal to back, and backed accordingly, driving two cars over the unfortunate man who had fallen on the track, and who was crushed to death.

Ties.

An Alabama man bet that he could walk on the ends of the cross-ties of a railroad while a train was passing. The floral offerings at his funeral were unusually ornate.—*Boston Transcript*.

The Supreme Court of Pennsylvania has decided that unless persons look both ways in crossing a railroad track they cannot obtain damages for injuries they may receive. This gives cross-eyed people a decided advantage over those who can see straight, and in some measure mitigates the affliction of being cross-eyed. Life is full of compensations.—*Boston Courier*.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Atlantic & Pacific, annual meeting, at the office in Boston, May 21.
Central of New Jersey, annual meeting, at the office in Jersey City, May 8, at noon.
Chicago, Burlington & Quincy, annual meeting, at the office in Chicago, April 29.
Delaware & Hudson Canal Co., annual meeting, at the office in New York, May 12, at noon.
Lake Shore & Michigan Southern, annual meeting, at the office in Cleveland, O., May 6.
Michigan Central, annual meeting, at the office in Detroit, Mich., May 7.
New York, Chicago & St. Louis, annual meeting, in Cleveland, O., May 6.
New York, Susquehanna & Western, annual meeting, at Taylor's Hotel, Jersey City, N. J., May 7, at noon.
Ohio Southern, annual meeting, at the office in Springfield, O., April 20, at noon.
Vicksburg & Meridian, annual meeting, at the office, No. 51 William street, New York, May 4, at noon.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Concord, 5 per cent., semi-annual, payable May 1, to stockholders of record on April 11.
Pacific Mail Steamship Co., 1¼ per cent., quarterly, payable May 1.
St. Louis, Alton & Terre Haute, 4½ per cent., on the preferred stock, payable May 1, to stockholders of record on April 25. This is for the year 1884; the dividend paid a year ago was 7 per cent.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *American Association of Train Dispatchers* will hold its annual convention in Denver, Col., on Wednesday, June 3.
The *Master Car-Builders' Association* will hold its annual convention at the Hygiea Hotel, Old Point Comfort (Fortress Monroe), Va., beginning on Tuesday, June 9.
The *Master Mechanics' Association* will hold its annual convention in Washington, beginning on Tuesday, June 16.
The *Car Accountants' Association* will hold its annual convention in Minneapolis, Minn., beginning on Tuesday, June 23.
The *General Baggage Agents' Association* will hold its half-yearly meeting in St. Paul, Minn., on Wednesday, July 15.
The *National Association of General Passenger & Ticket Agents* will hold its next half-yearly meeting in New York, at 11 a. m., on Tuesday, Sept. 15.
The *Master Car-Builders' Club* will hold regular meetings at its rooms, No. 113 Liberty street, New York, on the evening of the third Thursday in each month.
The *New England Railroad Club* will hold its regular meetings at its rooms in the Boston & Albany station, in Boston, on the evening of the fourth Wednesday in each month.
The *Western Railway Club* will hold regular meetings at its rooms, No. 102 Adams street, Chicago, on the third Wednesday in each month.

Foreclosure Sales.

The *Connotton Valley* road will be sold in Cleveland, O., May 9, under decrees of foreclosure. The road is of 3 ft. gauge, and runs from Cleveland, O., to Coshocton, 115 miles, with branches to Sherrodsville, 43 miles, and to Minerva, 3 miles. The total debt amounts to \$7,312,363. Nearly all the bondholders have joined in a plan for the purchase of the road and the organization of a new company.

The *Ohio Central*, main line, was sold in Toledo, O., April 15, to C. Canda, representing the bondholders of the main line, for \$1,000,000, the lowest bid allowed by the terms of sale. No other bid was made. Terminal property in Toledo and in Columbus was then offered, and was knocked down to J. A. Johnson, representing terminal property bondholders, for \$75,000, also without competition. This was also the minimum sum allowed by the terms of sale. The result of the entire sale was in accord with an understanding of the bondholders. An agreement is expected between the two committees, representing the two sets of purchasers, by which a thorough reorganization will be effected as soon as the sales are confirmed. The Terminal Committee places in the Master Commissioner's hands \$50,000 in bonds, the other committee \$200,000 of main line bonds, as guarantees for the entire amount.

Association of American Railroad Superintendents.

The half yearly meeting of this Association began in Richmond, Va., April 15. The first day was devoted largely to routine work, the election of officers, etc. There was also some discussion of questions of interest.

Master Car-Builders' Meeting.

A meeting of Master Car-Builders was held at the Tift House, Buffalo, April 8, in pursuance of adjournment. Mr. T. S. Frederick, of the West Shore, was called to the chair, and Mr. William McWood was secretary. The subjects discussed were the Condition of Cars for the Interchange of Traffic and the Breakage of Car Wheels.

The plan of organizing a permanent club, with headquarters at Buffalo, was discussed, and was finally referred to a committee, which is to report at the next meeting. The meeting finally adjourned until the second Wednesday in August, at the same place.

Master Mechanics' Association.

Mr. J. H. Setchel, secretary, and Messrs. E. H. Williams, S. A. Hodgman and T. L. Chapman, committee of arrangements, have issued the following circular:

"You are cordially invited to attend the 18th Annual Meeting of the American Railway Master Mechanics' Association, which will convene at Willard's Hotel, Washington, D. C., the third Tuesday in June, 1885.

"Members, their families and friends can secure good accommodations, with rooms near each other, by notifying the secretary, stating whom they wish accommodated. The charges will be \$3 per day for each person."

Central Passenger Committee.

The adjourned meeting of general passenger and ticket agents of the roads west of the trunk lines and east of Chicago and St. Louis, was held in St. Louis, April 9, with a very large attendance. The preliminaries having been almost all settled at the Indianapolis meeting, the meeting proceeded at once to business, and an agreement was adopted for the purpose of obtaining a restoration of rates within the territory served by the roads represented.

On the second day an organization was completed, to be

known as the Central Passenger Committee, and the agreement as discussed on the preceding day was adopted. It is as follows:

1. The transportation companies, parties hereto, running and operating lines west of the established termini of the trunk lines and east of the line of the Chicago & Alton Railway, but including Chicago, St. Louis and Peoria, on east-bound business, and north of the Ohio River, but including the states of Kentucky and Tennessee, hereby associate and constitute the Central Passenger Committee.

2. The officers of this Central Passenger Committee shall consist of a chairman, vice-chairman and secretary, said officers to be elected at the first regular meeting and their successors at each semi-annual meeting thereafter.

3. This committee shall cause to be prepared and published, to parties interested, rates of fare from all competitive points in the territory described, and these rates shall not be changed at any point except with the previous concurrence of the committee, and all joint rate sheets that may be published must bear the approval of the Chairman.

4. The Chairman of the Central Passenger Committee shall hear and decide all complaints for infraction of the rules and agreements of the committee, in the manner and within the limitations herein expressed.

5. All ticket sellers of companies, parties hereto, shall be required by their general passenger or ticket agents to maintain agreed rates and rates based thereon, regardless of competition, and report to the respective general passenger or ticket agents, immediately, any case of rate cutting which may come to their knowledge.

6. Any ticket-seller who shall sell any ticket at less than agreed rates, or make any concessions in limitation, class or conditions of transportation, or shall sell any tickets upon which any rebate is paid or any deduction allowed by whatever person, subterfuge or evasion, shall be liable to pay to the Chairman of this committee a fine of \$50 for the first offense, and for the second offense he shall be discharged from the service of the company by whom he is employed. Any ticket-seller discharged for this cause shall not be again permitted to sell tickets for any company party hereto for one year from the date of complaint under which he has been discharged.

7. In case any ticket-seller thus discharged shall plead that the cut was made by the agent of a connecting line, or by any other person, without his knowledge or consent, and beyond his power to prevent, the case shall be at his request reopened. At the next meeting of the Central Passenger Committee thereafter, a special committee of not less than two disinterested members shall be elected by the Central Passenger Committee to sit with the Chairman in the rehearing of the case, and the decision of the committee, thus constituted, shall be final as regards the discharge of the ticket-seller, but in no case shall the fine be remitted, and the Central Passenger Committee, in behalf of the company whose rates have been thus tampered with, shall take such measures as they deem best to prevent its recurrence. If any ticket-seller shall refuse to answer or to make payment upon notice from the Chairman, as provided in this agreement, the company by whom he is employed shall pay the amount of the penalty and discharge the ticket-seller without further hearing by the Chairman.

8. All complaints for rate cutting shall be presented by the general passenger or ticket agent of the complaining company, supported by the affidavit of one or more reputable persons and such collateral evidence as may be obtained. If this is sufficient to establish a presumptive case, the proceedings upon the complaint shall be summary. Within five days from the receipt of the complaint the Chairman shall furnish the accused with copies of the papers, and notify him to pay the amount of the penalty forthwith. If the accused party shall make a good defense against the charges at a subsequent hearing, the money shall be refunded. If the case is a second offense, the Chairman shall notify the general passenger or ticket agent of the offending company, whereupon he shall cause the offending ticket-seller to be suspended, pending the final decision of the case.

9. All tickets purchased to test rates, and so proven to this committee, shall be redeemed by the company issuing the same, at full tariff rates.

10. The Chairman shall appoint such times and places for hearing cases of complaint as he may deem most convenient for all parties interested.

11. All fines collected by the Chairman shall, after final decision of the respective cases, be applied toward the expenses of this committee.

12. The regular meeting of the Central Passenger Committee shall be held on the Tuesday on or next before the 20th of each month. Each meeting shall fix the place of the next regular meeting before its adjournment. The Chairman may call special meetings of the committee to meet emergencies, and shall call special meetings at any time upon the request of the members.

13. The within articles shall take effect and be in force on and after May 1, 1885.

The agreement was signed by the representatives of the following roads: Baltimore & Ohio; Chicago, St. Louis & Pittsburgh; Cincinnati, Hamilton & Dayton; Cincinnati, Hamilton & Indianapolis; Cincinnati, Indianapolis, St. Louis & Chicago; Cincinnati, Richmond & Chicago; Cincinnati & Springfield; Cincinnati, Washington & Baltimore; Cincinnati, Wabash & Michigan; Cleveland, Columbus, Cincinnati & Indianapolis; Cleveland & Marietta; Cleveland, Mount Vernon & Delaware; Columbus & Cincinnati Midland; Columbus, Hocking Valley & Toledo; Danville, Olney & Ohio River; Dayton & Ironton; Dayton & Michigan; Dayton & Toledo; Dayton & Union; Indiana, Bloomington & Western; Indianapolis, Decatur & Springfield; Indianapolis & St. Louis; Kentucky Central; Lake Erie & Western; Lake Shore & Michigan Southern; Louisville, Evansville & St. Louis; Louisville & Nashville; Louisville, New Albany & Chicago; McComb, Deshler & Toledo; Mt. Gilead Short Line; New York, Pennsylvania & Ohio; Ohio & Mississippi; Ohio Southern; Pennsylvania Co.; Pittsburgh, Cincinnati & St. Louis; Pittsburgh & Lake Erie; Terre Haute & Indianapolis; Wabash, St. Louis & Pacific; Wheeling & Lake Erie.

The organization of the committee was completed by electing Mr. S. F. Pierson Chairman. The rate clerks of the companies were instructed to meet and prepare a schedule of rates. The agreement will necessarily have to be submitted to the different managers of the roads for their approval. The new association, after signing the agreement, adjourned to meet again in Indianapolis, May 21.

ELECTIONS AND APPOINTMENTS.

Allegheny Valley.—At the annual meeting in Pittsburgh, April 14, the following directors were chosen: John Scott, George B. Roberts, David A. Stewart, A. J. Cassatt, Charles E. Speer, John P. Green, N. Parker Shortridge, Edmund Smith, J. N. DuBarry.

American Society of Civil Engineers.—At the last regular meeting the following candidates were elected members: Clifford Buxton, Toledo, O.; Richard Morley Harrison, Liverpool, England; John Franklin Hinkley, North Springfield, Mo.; Olaf Hoff, Pittsburg, Pa.; Edmund Dorman Libby, St. Louis, Mo.; Robert Henry Temple, Richmond, Va.;

Theodore Voorhees, Ballston Spa, N. Y. As junior, David Coley Sanford, New Haven, Conn.

Association of American Railroad Superintendents.—At the meeting in Richmond, Va., April 15, the following officers were elected for next year: W. H. Stevenson, New York, New Haven & Hartford, President; J. M. Metheny, Grand Rapids & Indiana, First Vice-President; H. F. Boyce, Chicago, Rock Island & Pacific, Second Vice-President; J. F. Divine, Wilmington & Weldon, Third Vice-President; Waterman Stone, Providence, Warren & Bristol, Secretary; C. D. Hammond, Albany & Susquehanna, Assistant Secretary; R. M. Sully, Petersburg, Treasurer. The following members of the Executive Committee were also elected: I. D. Barton, Long Island; J. T. Furber, Boston & Maine; L. W. Palmer, New York & New England, and A. A. Folsom, Boston & Providence.

Bennington & Rutland.—Mr. Charles McMasters has been appointed Master Mechanic, with office in Rutland, Vermont.

Canadian Pacific.—Mr. J. S. Anderson has been appointed General Baggage Agent. Mr. D. M. Sexton succeeds Mr. Anderson as Lost Freight Agent.

Central Passenger Committee.—The officers of this new organization are: Chairman, S. F. Pierson; Vice-Chairman, C. K. Lord.

Chicago & Alton Leased Lines.—At the annual meetings in Chicago last week directors were chosen as below for this company's controlled and leased lines: *Alton & St. Louis*.—Directors, Lorenzo Blackstone, John J. Mitchell, T. B. Blackstone, Lorenzo Blackstone President; T. B. Blackstone, Secretary, *Joliet & Chicago*.—Directors, John Crerar, Wm. A. Slater, John B. Drake, J. McGregor Adams and T. B. Blackstone. John Crerar, President; Chas. H. Foster, Secretary. *Mississippi River Bridge Co.*—Directors, Geo. Straut, J. J. Mitchell, T. B. Blackstone, John B. Drake and John Crerar. John Crerar, President; Chas. H. Foster, Secretary and Treasurer. *St. Louis, Jacksonville & Chicago*.—Directors, George Straut, T. B. Blackstone, John Crerar, W. W. Green and L. E. Worcester. George Straut, President; William J. Bryson, Secretary; T. B. Blackstone, Treasurer.

Chicago & Eastern Illinois.—Mr. H. A. Rubidge, Auditor, has been appointed Secretary also, in place of A. S. Dunham, resigned.

Cincinnati, Richmond & Fort Wayne.—This company has elected Wm. Parry President; W. O. Hughart, Vice-President; John P. Hughart, Secretary and Treasurer. The road is leased to the Grand Rapids & Indiana.

Cincinnati, Wabash & Michigan.—The board has elected the following officers: J. H. Wade, President; W. Bingham, Vice-President; Secretary and Treasurer, W. S. Jones; General Manager, Norman Beckley; Superintendent, O. W. Lampert; General Freight and Ticket Agent, Owen Rice; Auditor, Owen Rice; Attorney, C. E. Cowgill.

Cincinnati, Washington & Baltimore.—The directors chosen last week have re-elected the old officers, as follows: Orland Smith, President; Edward R. Bacon, Vice-President; Chas. F. Low, Secretary and Auditor; Wm. E. Jones, Treasurer.

Cleveland, Toledo & Lake Side.—The directors of this new company are: Thomas Flesher, Cleveland, O.; Henry Graeve, J. D. Lea, E. H. Marsh, Sandusky, O.; A. A. Marsh, New York.

Colorado Railroad Commission.—Mr. R. W. Woodbury has been appointed Railroad Commissioner of Colorado.

Dakota Railroad Commission.—Dakota is the first territory to have a railroad commission; its members are W. H. McVay, of Yankton; W. M. Evans, of Milbank, and Alexander Griggs, of Grand Forks. The Secretary is I. E. West, of Fargo.

Des Moines, Osceola & Southern.—The United States Circuit Court at Dubuque, Ia., has appointed Mr. E. R. Mason, of Des Moines, Ia., Receiver of this road. The Iowa Circuit Court had already appointed a receiver, as noted last week.

Dunkirk, Allegheny Valley & Pittsburgh.—At the annual meeting in Albany, N. Y., April 15, the following directors were chosen: Edwin D. Worcester, Cornelius Vanderbilt, William K. Vanderbilt, Frederick W. Vanderbilt, Samuel F. Barger, James H. Rutter, Charles C. Clarke, Chauncey M. Depew, Horace J. Hayden, Dwight W. Fardee, Darwin Thayer, Oscar W. Johnson, Russell Brown.

Illinois Railroad & Warehouse Commission.—The Governor of Illinois has appointed Messrs. John I. Rinaker of Carlinville, Benjamin F. Marsh, of Warsaw, and Wm. T. Johnson, of Chicago, Railroad and Warehouse Commissioners of that State. Gen. Rinaker is a lawyer; Mr. Marsh is a farmer, and was a member of Congress for several terms; Mr. Johnson is a hardware merchant, and has been a State Senator and Treasurer of Cook County.

International & Great Northern.—At the annual meeting, in Palestine, Texas, April 7, the old directors were re-elected, and the board subsequently re-elected all the old officers.

Iowa Railroad Commission.—Mr. L. S. Coffin has been re-appointed Railroad Commissioner of Iowa for a term of three years. Two years ago he was appointed a member of the board to fill a vacancy caused by resignation.

Long Island.—At the annual meeting in Long Island City, N. Y., April 14, the following directors were chosen: D. Bowers, Austin Corbin, D. C. Corbin, J. D. Campbell, J. G. K. Duer, Henry Graves, Wm. B. Kendall, J. Rogers Maxwell, N. W. Maxwell, Frederick W. Peck, Alfred Sully, John P. Townsend, Edward Tuck.

Mann Boudoir Car Co..—At the annual meeting in New York, April 14, all the old officers were re-elected.

Mexican Central.—The directors have organized by re-electing Levi C. Wade President; Robert R. Symon, of London, Eng., Vice-President; S. W. Reynolds, Clerk and Treasurer; J. H. Goodspeed, General Auditor; Daniel B. Robinson, General Manager; B. P. Cheney, C. J. Paine, Jacob Edwards, Warren Sawyer, Isaac T. Burr, Albert W. Nickerson and Levi C. Wade, Finance Committee.

Minnesota Railroad Commission.—Under the new law establishing a board of three commissioners, Mr. J. H. Baker continues in office and S. S. Murdock and G. L. Becker are appointed the additional members of the board.

Missouri Pacific.—Mr. Joseph Herrin has been appointed Superintendent of all the Missouri, Kansas & Texas lines south of Division; that is, of all its lines in Texas. He has been for some time Superintendent of the International & Great Northern.

Morgan's Louisiana & Texas.—At the annual meeting in New Orleans, April 6, the following directors were elected: C. P. Huntington, New York; A. C. Hutchinson, J. G. Schriever, John B. Richardson, J. Kruttschnitt, New Orleans. At a meeting of the board the following officers were elected: A. C. Hutchinson, President; J. G. Schriever, Vice-President; John B. Richardson, Secretary and Treasurer.

I. E. Gates, Assistant Secretary, New York; George Watson, Transfer Agent, New York.

New York Central & Hudson River.—At the annual meeting in Albany, N. Y., April 15, the old directors were re-elected, as follows: William H. Vanderbilt, Cornelius Vanderbilt, James H. Rutter, Charles C. Clarke, Chauncey M. Depew, Horace J. Hayden, William K. Vanderbilt, Frederick W. Vanderbilt, Samuel F. Barger, J. P. Morgan, Cyrus W. Field, New York; William Bliss, Boston; Sherman S. Jewett, Buffalo.

New York, Woodhaven & Rockaway.—At a meeting of the new board, April 9, the following officers were elected: President, James M. Oakley; Treasurer, E. C. Fisk; Secretary, P. H. Cassidy.

North Conway & Mt. Kearsage.—This company was organized April 10 by the election of the following directors: N. W. Pease, Lycurgus Pitman, North Conway, N. H.; M. C. Wentworth, Jackson, N. H.; Wm. Wheeler, Concord, Mass.; J. E. Manning, Boston. At a meeting of the directors the following officers were elected: President (pro tem.), N. W. Pease; Vice-President, William Wheeler; Treasurer, Elbert Wheeler, of Nashua, N. H.; Clerk, Lycurgus Pitman; General Manager, George E. Mansfield, of Boston.

Northern Pacific.—Mr. F. W. Gilbert is appointed superintendent of the Rocky Mountain Division in place of J. B. Cable, resigned. He was recently engineer of the terminal works at Portland.

Ohio Southern.—Mr. John Sloan has been appointed General Roadmaster. He holds the same position on the Indiana-Bloomington & Western road.

Oregonian.—Mr. Charles N. Scott, of Portland, Oregon, has been appointed Receiver of this road.

Pennsylvania Company.—General Passenger Agent E. A. Ford announces the following changes for the passenger department of the lines under his jurisdiction: C. W. Adams, at present Assistant General Passenger Agent of the Pennsylvania Co. at Chicago, also assumes the same position for the Chicago, St. Louis & Pittsburgh, in place of Frank Van Dusen, recently transferred to Cincinnati. D. I. Roberts, Traveling Passenger Agent for the Northwest, is promoted to be District Passenger Agent at Columbus, O., in place of F. M. Caldwell, transferred and appointed District Passenger Agent at Fort Wayne, Ind. F. O. Field, at present Panhandle Ticket Agent at Chicago, is made Ticket Agent at Columbus, O., in place of Mr. Mandel, resigned. Charles L. Kimball, at present District Passenger Agent of the Pennsylvania Co. at Cleveland, O., is promoted to be Assistant General Passenger Agent, and placed in charge of the Cleveland, Toledo and Fort Wayne district passenger agencies, which are to be consolidated, with office at Cleveland, O. Mr. Dawson, present District Passenger Agent at Toledo, has resigned. James M. Greaves, at present City Ticket Agent at Indianapolis, becomes Traveling Passenger Agent for the Pennsylvania lines in the Northwest, with headquarters at Minneapolis, Minn., vice D. I. Roberts, transferred. George Rech, now acting as assistant ticket agent at Indianapolis, is promoted to be City Ticket Agent in place of Greaves, transferred.

Reading & Chesapeake.—At the annual meeting last week the following were elected: President, Henry Baumgardner, Lancaster, Pa.; Directors, S. T. Davis, J. W. F. Swift, Lancaster, Pa.; Charles J. Rhoads, Safe Harbor, Pa.; Esaias Billingfelt, Adamstown, Pa.; Henry Eppeheimer, Isaac McHose, Reading, Pa.; S. Webber Parker, New York.

St. Andrews Bay & Chippewy.—The following are the officers of this Florida company: President, Carr Aldrich; Vice-President and General Manager of construction, H. R. Newman; Secretary, J. H. Tichnor; Chief Engineer of construction, W. H. Darling.

St. Johnsbury & Lake Champlain.—At a meeting of the board last week five of the old board resigned and new directors, representing the Boston & Lowell, were elected. The board, as now constituted, is as follows: Horace Fairbanks, Franklin Fairbanks, A. B. Jewett and Bradley Barlow, of Vermont; Edwin Morey, William Power Mason, Frederick E. Clarke, C. S. Mellen and William A. Stowell, of the Boston & Lowell.

Texas Central.—Messrs. Benjamin G. Clark and Charles Dillingham have been appointed Receivers. They are also Receivers of the Houston & Texas Central, which controls this road.

Texas & St. Louis.—Mr. Samuel W. Fordyce, of Hot Springs, Ark., has been appointed Receiver in place of W. R. Woodward, resigned. Mr. Fordyce was at one time Vice-President of the company, and had much to do with the construction of the road.

PERSONAL.

—The resignation of Mr. W. R. Woodard, as Receiver of the Texas & St. Louis road, has finally been accepted by the Court. Mr. Woodard has received offers of two or three positions, and has not yet decided which to accept.

—Mr. Charles B. Pitman, late Roadmaster of the Occidental Branch of the Nicaraguan railroad system, has been appointed Principal Assistant Engineer of the National Railroad, and has taken charge of the surveys of the Central Division of that line, which is to complete the connection between Lake Nicaragua and the Atlantic coast.

—Col. Robert Forsythe, General Freight Agent of the Chicago & Eastern Illinois road, died in Savannah, Ga., April 15. He had been connected with the road ever since the organization of the present company. He has been in poor health for some time, and at the time of his death was on a trip South in the hope of receiving some benefit.

—Col. Henry Flad, the well-known engineer, has been re-elected President of the Board of Public Improvements of St. Louis by a large majority. Col. Flad's re-election was secured entirely by his personal popularity and eminent qualifications for the position, as he ran far ahead of his ticket, and was in fact the only candidate on it who was elected.

—Mr. David S. Draper, for many years director and Vice-President of the Housatonic Railroad Co., died suddenly at his residence in New York, April 3. He was for a long time in the fruit importing business in New York, but retired some 15 years ago. Since that time he has been a large investor and a director in a number of mining and manufacturing companies.

—Mr. Charles H. Cummings, General Eastern Passenger Agent of the Lehigh Valley road, was married April 9, at Mauch Chunk, Pa., to Miss Mary Packer, daughter and now only surviving child of the late Asa Packer, for many years President of the Lehigh Valley Co. Mr. Cummings has been on the Lehigh Valley road for a number of years, beginning as a conductor.

—Mr. J. B. Cable has resigned his position as Superintendent of the Rocky Mountain Division of the Northern Pacific, and will, it is said, accept a position on one of the lines running

eastward from St. Paul. He has been on the Northern Pacific about a year and a half, and was previously for several years Division Superintendent on the St. Paul, Minneapolis & Manitoba road.

—Major W. J. Parmentier, General Freight Agent of the New Jersey Southern and Philadelphia & Atlantic City divisions of the Philadelphia & Reading road, died suddenly April 10th, at his residence in Lakewood, N. J., aged 55 years. He was for a number of years General Freight and Passenger Agent of the New Jersey Southern road, and when that road passed under the control of the New Jersey Central, and afterwards of the Reading, he was continued in charge of freight traffic of the line.

—Col. Eli Culverhouse, General Manager of the Kansas & Gulf Short Line, expects to resign his position shortly, as soon as the road now under construction is completed. He is now in New York for the purpose of purchasing 4 passenger cars, 50 freight cars and other equipment for the road. Col. Culverhouse has had many years' experience as an engineer, both in this country and in England, and has represented the interest of several large capitalists on various lines for a number of years. He took charge of the Short Line to superintend its construction, and will retire in consequence of the death of the capitalist of whose interest he had charge.

—Mr. Charles Griffin Miller, who died at his residence in New Rochelle, N. Y., April 10, aged 61 years, was for many years a successful merchant in Buffalo. He was largely interested in the building of the Buffalo, New York & Erie road, and was a director of the company from its organization. He was afterwards Receiver of the road for a time, and on its reorganization was chosen President, holding that position for 20 years, and finally retiring in 1882. As President he negotiated the lease of the road to the Erie Railroad Co. Some 20 years ago he removed from Buffalo to New York and engaged in banking business there. He leaves a considerable property, having been a large investor in insurance as well as in railroad companies.

—Mr. Lansing Millis died in Boston April 9, of paralysis of the heart, aged 55 years. He was born in Ogdensburg, N. Y., and while still a young man became freight agent of the Michigan Southern & Northern Indiana. After serving with that road and the Grand Trunk for several years he engaged with the Receivers of the Vermont Central in 1861, and has ever since retained his connection with that road, and with its successor the Central Vermont, serving successively as General Agent, General Freight Agent, Traffic Manager, and for several years past as Superintendent of Through Traffic, having his office in Boston. He has been also for a number of years President of the National Car Co., and for nearly a year past was also President of the Ogdensburg & Lake Champlain Railroad Co. Mr. Millis was regarded as a man of exceptional ability, and from long experience was probably better acquainted than any other man with the traffic and business of the Central Vermont and its connecting lines.

—Col. James Worrall, formerly a well-known engineer, died in Harrisburg, Pa., April 1, aged 73 years. Mr. Worrall learned his profession under the late S. W. Rawle and assisted in the surveys of some of the earlier railroads in Pennsylvania, and was afterward employed on the Erie Canal, the Chesapeake & Ohio Canal, and under Colonel Schlatter on the Camden & Amboy branch from Trenton to New Brunswick. In 1838 he was employed as assistant on the survey of what was known as the "Tapeworm road" for the state of Pennsylvania, which followed very nearly the line now taken by the South Pennsylvania. Later he became a contractor and had heavy contracts on St. Lawrence Canal and on the Rutland and the Ogdensburg & Lake Champlain roads. In 1850 he became Chief Engineer of the Union Canal in Pennsylvania, and afterward had charge of the building of the Western Division of the Philadelphia & Erie. During the war he was employed in the Quartermaster's department, and after its close was engaged in making surveys for river improvements in Illinois and Wisconsin. For several years past he had retired from active engineering work, although he has been engaged as Fish Commissioner for the state of Pennsylvania.

TRAFFIC AND EARNINGS.

Coal.

Coal tonnages for the week ending April 4 are reported as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Anthracite	433,917	756,881	D. 322,964	42.7
Eastern bituminous	338,028	165,381	D. 172,647	10.9
Coke	51,602	64,430	D. 12,828	10.9

The anthracite production is as large as the allotment will permit. The long continuance of cold weather has helped the trade somewhat.

The falling off in bituminous shipments is chiefly from the Western Pennsylvania districts, where mining has been largely stopped by strikes.

The coal tonnage of the Pennsylvania Railroad for the week ending April 4 was:

	Coal.	Coke.	Total.	1884.
Line of road	118,614	50,793	169,407	183,311
From other lines	82,634	809	83,443	77,207

Total..... 201,248 51,602 252,850 260,518

Year to April 4..... 2,619,567 625,900 3,245,467 3,322,640

Decrease for the week, 7,668 tons, or 2.9 per cent.; for the year, 177,173 tons, or 5.3 per cent.

Actual tonnage passing over the Pennsylvania & New York road for the four months of its fiscal year from Dec. 1 to March 28 was:

	1885.	1884.	Decrease.	P. c.
Anthracite	318,501	350,928	32,427	11.5
Bituminous	86,536	101,777	15,241	14.9

Total..... 405,037 452,705 47,668 12.3

The larger part of the anthracite comes from the Lehigh Valley road, of which this line is an extension.

San Francisco coal receipts for the three months ending March 31 were 238,778 tons, against 211,166 tons for the corresponding quarter last year; an increase of 27,612 tons, or 13.1 per cent.

Anthracite coal tonnage for the month of March and the three months ending March 31 is reported as follows by Mr. John H. Jones, the Official Accountant, this statement including the entire production of anthracite coal, excepting that consumed by employes and for steam and heating purposes about the mines:

	March.	Three months.	1885.	1884.
Phila. & Reading	688,088	1,045,510	1,957,442	1,957,442
Lehigh Valley	361,276	881,764	1,151,254	1,151,254
Del. Lack. & West.	365,971	914,292	994,794	994,794
Del. & Hud. Canal Co.	190,507	523,453	608,445	608,445
Pennsylvania R. R.	277,422	700,382	641,444	641,444
Coal Co.	93,315	248,692	248,692	248,692
N. Y., L. E. & W.	49,211	115,304	73,698	73,698

Total..... 2,025,790 1,881,462 5,435,301 5,673,792

Increase for the month, 144,328 tons, or 7.9 per cent.; decrease for the three months, 238,421 tons, or 4.2 per cent.

The stock of coal on hand at tide-water shipping points March 31, 1885, was 431,424 tons; on Feb. 28, 1885, 665,565 tons; decrease, 234,141 tons, or 35.2 per cent.

Oregon Passenger Rates.

The Oregon Legislature has passed a law restricting passenger rates on all lines in the state to 4 cents per mile; the companies are allowed to charge 3 cents per mile for children. The Oregon Railway & Navigation Co. gives notice of the required changes in its rates, and at the same time withdraws all half rates and special fares.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

Three months ending March 31:

	1885.	1884.	Inc. or Dec.	P. c.
Bur. C. R. & No.	\$688,624	\$633,175	I. \$55,449	10.3
Chas. Col. & A.	237,165	210,539	I. 26,626	9.5
Chi. & W. Mich.	249,118	344,001	D. 94,883	27.8
Cin. W. & Balt.	474,326	437,374	I. 36,952	8.5
Cleve. Ak. & Col.	104,832	100,528	I. 4,304	3.3
Col. & Greenville	211,716	188,341	I. 23,375	12.4
Denver & R. G.	1,298,834	1,129,614	I. 169,220	14.9
Denver & R. G. Western	195,126	163,315	I. 31,811	19.5
Flint & Pere M.	432,060	596,786	D. 164,726	27.7
Fla. Ry. & N. Co.	261,493	259,430	I. 2,063	1.2
Ft. Worth & D.	78,364	84,420	D. 6,056	7.2
Georgia Pacific	169,424	140,906	I. 28,518	20.2
Grand Trunk	3,493,590	3,923,053	D. 429,463	10.9
Illinois Central	1,525,960	1,414,538	I. 111,422	7.9
Ill. lines	1,191,767	1,070,342	I. 121,425	11.3
Iowa lines	349,620	405,314	D. 55,694	13.7
Ind. Bloom. & W.	563,151	547,031	I. 16,120	2.9
Kan. C. Ft. S. & Gulf	602,004	582,509	I. 79,495	13.6
Kan. City, Spr. & Mem.	461,355	200,273	I. 261,082	100.6
Louis. & Nash.	3,514,752	3,242,486	I. 272,266	8.4
Marq. H. & Ont.	60,358	63,805	D. 3,447	5.4
Mexican Central	950,358	614,038	I. 336,320	56.2
Min. L. S. & W.	248,415	251,939	D. 3,524	1.4
Mobile & Ohio	500,505	525,786	D. 25,281	4.6
Norfolk & West.	619,102	648,675	D. 29,573	4.6
Peoria, Dec. & E.	176,371	189,238	D. 12,867	6.8
Rich. & Dan.	987,843	949,844	I. 37,999	4.0
St. L. A. & T. H.	298,976	371,729	D. 72,753	19.5
Main Line	197,479	206,730	D. 9,251	4.4
Belleville Line	119,716	122,338	D. 2,622	2.1
St. L. & San Fran.	1,004,310	1,064,979	D. 60,669	5.7
St. P. & Duluth	212,198	198,857	I. 13,341	6.7
Tol. Ann Arbor	65,200	47,461	I. 17,739	37.4
Wab. St. L. & P.	3,773,061	3,885,363	D. 112,302	2.9
Western N. C.	105,899	92,179	I. 13,720	14.9
Wisconsin Cent.	332,838	360,671	D. 27,833	7.7

Two months ending Feb. 28:

	1885.	1884.	Inc. or Dec.	P. c.
Atch. T. & S. F.	\$2,180,445	\$2,330,367	D. \$159,922	6.8
Net earnings	856,432	1,186,360	D. 329,928	27.8
Bur. C. R. & No.	426,256	415,827	I. 10,429	2.5
Net earnings	92,364	114,829	D. 22,465	19.6
Cin. Ind. St. L. & Chi.	375,988	293,003	I. 82,985	28.3
Net earnings	120,524	85,419	I. 35,105	41.1
Dan. & Norwalk	27,050	25,737	I. 1,313	7.4
Des M. & Ft. D.	52,936	53,069	D. 133	0.2
Net earnings	11,185	16,130	D. 4,945	30.8

Month of February:

	1885.	1884.	Inc. or Dec.	P. c.
Atch. T. & S. F.	\$1,064,747	\$1,167,020	D. \$102,273	8.8
Net earnings	411,528	583,676	D. 172,148	29.3
Bur. C. R. & No.	202,537	201,064	I. 1,473	0.7
Net earnings	41,477	54,679	D. 13,202	24.0
Cin. Ind. St. L. & Chi.	172,544	122,686	I. 49,858	40.5
Net earnings	51,176	29,553	I. 21,623	73.0
Dan. & Norwalk	13,489	13,541	D. 52	0.4
Des M. & Ft. D.	27,725	27,215	I. 510	1.8
Net earnings	6,735	8,959	D. 2,224	24.7

Month of March:

	1885.	1884.	Inc. or Dec.	P. c.
Atlantic & Pac.	\$171,000	\$171,000	I. \$0	0.0
Bur. C. R. & No.	272,368	\$217,348	I. \$55,020	25.3
Chas. Col. & A.	75,578	68,232	I. 7,346	10.8
Chi. & W. Mich.	111,449	130,987	D. 19,538	14.9
Cin. W. & Balt.	164,731	175,102	D. 10,371	5.9
Cleve. Ak. & Col.	40,041	39,124	I. 917	2.4
Col. & Greenville	60,062	59,787	I. 275	0.5
Denver & R. G.	511,913	398,357	I. 113,556	28.5
Denver & R. G. Western	69,100	62,131	I. 6,969	11.2
Flint & Pere M.	157,946	218,519	D. 60,573	27.7
Fla. Ry. & N. Co.	80,855	82,000	D. 1,145	1.4
Ft. Worth & D.	31,127	29,600	I. 1,527	5.2
Georgia Pacific	56,202	44,004	I. 11,998	26.0
Grand Trunk	1,067,700	1,221,633	D. 153,933	10.9

Illinois Central—

	1885.	1884.	Inc. or Dec.	P. c.
Ill. lines	554,574	484,453	I. 70,121	14.4
Southern Div.	406,326	360,156	I. 46,170	12.8
Iowa lines	145,217	142,159	I. 3,058	2.2
Ind. Bloom. & W.	227,088	193,222	I. 33,866	17.5
Kan. City, Ft. S. & Gulf	220,910	213,897	I. 7,013	3.3
Kan. City, Spr. & Mem.	157,782	65,679	I. 92,103	140.2
Louis. & Nash.	1,260,695	1,187,738	I. 72,957	6.1
Marq. H. & Ont.	22,039	24,652	D. 2,613	10.7
Mexican Central	360,000	232,833	I. 127,167	50.3
Min. L. S. & W.	103,060	100,357	I. 2,703	2.7
Mobile & Ohio	195,140	185,275	I. 9,865	5.3
Norfolk & West.	192,471	210,298	D. 17,827	8.5
Peoria, Dec. & E.	59,187	68,058	D. 8,871	13.0
Rich. & Dan.	332,800	349,200	D. 16,400	4.7
St. Jo. & Western	117,452	.....	.....	.....

St. L. A. & T. H.

Mouls. & Nashv.	1,260,695	1,187,738	I.	72,957	6.
Marqu., H. & Ont.	22,039	24,682	D.	2,653	10.
Michigan Central.	360,000	232,833	I.	117,167	50.
Mil. L. & W.	103,060	100,357	I.	2,703	2.
Mobile & Ohio.	195,140	185,275	I.	9,865	5.
Norfolk & West.	192,471	210,298	D.	17,827	8.
Peoria, Dec. & E.	59,187	68,058	D.	8,871	13.
Rich. & Dan.	312,300	349,300	I.	3,100	0.
St. L. & W.	119,292				

tie, of the Boston & Maine, presided, and Mr. E. H. Hibbard, of the Canadian Pacific, was Secretary. After a long discussion, it was decided to adopt substantially the same rates as were in force last season, except that rates for tourist routes over the New York Central or the West Shore will be based on those now in force over those lines unless they should be advanced.

Cotton.

Cotton movement for the week ending April 10 is reported as follows in bales:

Interior markets:	1885.	1884.	Inc. or Dec.	P. c.
Receipts	12,021	28,380	D. 16,359	58.4
Shipments	28,113	43,715	D. 15,602	35.9
Stock, April 10	128,906	110,068	I. 18,838	17.1
Seaports:				
Receipts	21,808	30,113	D. 8,305	27.6
Exports	58,178	48,970	I. 9,208	18.8
Stock, April 10	625,539	631,515	D. 5,976	0.9

The total movement from plantations for the cotton year (from Sept. 1) to April 10 is estimated at 5,485,908 bales, against 5,473,014 last year, 6,521,438 in 1882-83, and 5,109,131 in 1881-82.

Central Iowa Traffic Association.

Recently the Wisconsin, Iowa & Nebraska (better known as the Diagonal line), which runs from Cedar Falls, Ia., to Des Moines, applied for admission into this association and a percentage of the through business eastward. An agreement has now been made by which the company agrees to give up the through traffic to Peoria and eastern points, which it has carried in connection with the Central Iowa, and in return to receive a stated monthly payment from the pool lines in the association.

Boston Traffic Notes.

Traffic on the Boston & Albany road for the past month has been unusually heavy. The total number of cars forwarded east from East Albany during March was 13,432; received from the East, 12,671; delivered to New York Central, 14,635; received from that road, 14,915.

During the month of March 7,194 loaded and 94 empty cars came east through the Hoosac Tunnel, as against 5,039 loaded and 190 empty cars in the corresponding month of 1884, an increase in the one case of 2,155, and a decrease in the other of 96.

RAILROAD LAW.

Liability for Damage by Fire.

A large number of suits have been begun against the Central Railroad & Banking Co., of Georgia, by citizens of Barnesville, Ga., to recover damages for property destroyed. A few months ago a quantity of cotton piled up at the freight depot was set on fire, it is charged, by sparks from the locomotive of a passing train. The fire spread rapidly and burned up the greater part of the town. The suits are brought to test the liability of the company for the damages which, it is claimed, were the result of its negligence.

Taxing Inter-State Commerce.

In Washington, April 13, the United States Supreme Court rendered a decision in the case of the Gloucester Ferry Co., plaintiff in error, against the commonwealth of Pennsylvania, appeal from the Supreme Court of Pennsylvania. This was a suit begun originally in the Court of Common Pleas of Philadelphia for the purpose of recovering from the company, which is a New Jersey corporation, the amount of certain taxes levied upon its capital stock under the law of 1879 of Pennsylvania. The Court of Common Pleas held that the taxes could not be lawfully levied because the ferry company carried on no business in Pennsylvania, except the landing and receiving of passengers and freight, and its business, therefore, came under the head of inter-state commerce, and was protected by the constitution of the United States from any burden imposed by state legislation.

The case was carried up to the Supreme Court of Pennsylvania, where this judgment was reversed, the Court holding that the company was liable to taxation under the Pennsylvania law.

The company then appealed the case to the United States Supreme Court, and that Court has now, in a long and elaborate opinion, reversed the judgment of the Pennsylvania Supreme Court and sustained that of the original court. The case is remanded to the Pennsylvania court for final settlement in accordance with this decision.

OLD AND NEW ROADS.

Americus, Preston & Lumpkin.—Grading on this road between Americus, Ga., and Preston is now well advanced. The engineers have just completed the location of the line from Preston to Lumpkin, and have, it is stated, found a very favorable line, which does not require much heavy work, although considerable bridging will be needed.

Atchison, Topeka & Santa Fe.—The company's statement for February and the two months ending Feb. 28 is as follows:

	February.	1884.	Inc. or Dec.	P. c.
Miles of road	1885.	1884.		
	2,375	2,315		
Earnings	\$1,064,747	\$1,167,020	\$2,180,445	\$2,339,367
Expenses	653,221	583,944	1,324,013	1,153,067
Net earnings	\$411,526	\$583,076	\$850,432	\$1,186,300
Per cent. of exps.	61.3	50.0	60.7	49.3

For the three months the gross earnings decreased \$158,922, or 6.8 per cent., and the expenses increased \$171,006, or 14.8 per cent., the result being a decrease of \$329,928, or 27.8 per cent., in net earnings.

Augusta, Gibson & Sandersville.—Work is progressing on the construction of this line, and the grading is now well advanced over most of the road. A proposal has been received by the company to build a branch from a point in Glascock County, Ga., by way of Mayfield to White Plains in Green County, a distance of about 35 miles. The people on the line of this proposed branch offer assistance toward its construction.

Baltimore & Ohio.—In correction of the report that this company had entirely changed its plans for an entrance into Philadelphia, the Press, of that city, says: "The Baltimore & Ohio has at last practically succeeded in obtaining the right of way into Philadelphia. The original plan is to be adhered to, and the road will cross the Schuylkill below the Gray's Ferry Bridge, follow the wharves on the East side to about Arch street, where the river takes a bend to the West, and thence in a direct line to Twenty-third street and Pennsylvania avenue, where connection is made with the tracks of the Philadelphia & Reading. Nothing but the adverse action of Councils or two or three property owners can prevent the successful completion of this route. It must be understood that the Baltimore & Ohio, as a corporation, does not enter over this line. The route in question is to be owned and operated by the Schuylkill River East Side Railway, a company incorporated under the laws of Pennsylvania, and doing

business simply in the county of Philadelphia. This line is the connecting link between the Baltimore & Ohio and the Philadelphia & Reading, and it is over its tracks that the two companies propose to exchange business. Although not a foot of track has been laid, the right of way has been almost completely secured, and actual construction may begin at any time."

The adoption of this line will not, however, prevent the building of the branch to the Delaware at the lower end of the city, and the use of the ferry connection to Camden, as recently described.

Boston & Maine.—The Boston Advertiser says: "The earnings of the combined Boston & Maine and Eastern roads during the first three months after the consolidation was effected showed a very considerable falling off as compared with last year, a loss, however, that was not altogether unexpected for that season of the year, and which will undoubtedly be fully offset before the summer is ended. During the month of January a net gain of about \$40,000 over 1884 was recorded, and in February a loss of \$2,000 was made, while in March the net income shows a good increase over last year. The summer business this year promises to be remarkably heavy, and from this time forward each month will, in all probability, make an excellent comparative showing."

Calabasas, Tucson & Northwestern.—This company has been organized at Calabasas, Arizona, to build a railroad from that place through the Santa Cruz Valley to Tucson, and thence to Florence, Phoenix and Globe. A branch from Tucson to Quijota is also proposed.

Central Massachusetts.—At a conference held last week the directors of the company made a proposition to sell the road as it stands to the Fitchburg Railroad Co. for \$1,000,000 in Fitchburg stock, which at present prices would be worth \$1,200,000. The Fitchburg directors did not entertain this proposition, but offered to run the road for 22½ per cent. of gross earnings. This offer was also rejected, but the negotiations were not closed and will be further continued.

Central Pacific.—It is officially stated that in the lease of this road to the Southern Pacific Co. there is nothing to prevent the yearly payment of \$1,200,000 over fixed charges from being applied to the settlement of floating debt. The \$1,200,000 does not necessarily go to the stockholders, but may be used for any purpose which the lesser company may think best.

Chattanooga & Charleston.—A company by this name has recently been obtaining right of way in some of the counties of North Georgia for a railroad to extend from Chattanooga, Tenn., to Augusta, Ga., as an extension of the Memphis & Charleston road.

Cincinnati, Indianapolis, St. Louis & Chicago.—This company's statement for February and the eight months of its fiscal year from July 1 to Feb. 28 is as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Earnings	\$122,544	\$122,686	I. \$49,858	40.5
Expenses	121,368	93,133	I. 28,235	30.3
Net earnings	\$51,176	\$9,553	I. \$21,623	73.1
Fixed charges	50,000	50,083	D. 83	0.2
Surplus	\$1,170	\$20,530	I. \$21,706	...
Surplus to Jan. 31	\$31,522	177,020	I. 54,498	30.8
Total, 8 months	\$232,698	\$156,496	I. \$76,202	48.7

* Deficit.

The very light earnings in February, 1884, were due to the great flood in the Ohio and the consequent stoppage and derangement of traffic at Cincinnati.

Cleveland, Toledo & Lake Side.—This company has filed articles of incorporation in Ohio, to build a railroad in Ottawa County commencing at a point on the Lake Shore & Michigan Southern Railroad near Gypsum station, running thence in an easterly direction to the end of the peninsula and terminating at or near Marblehead lighthouse. The line will be about 6 miles long.

Connecticut Railroad Legislation.—The so-called "Short Haul" bill, prohibiting charging for the transportation of freight to any point a greater sum than is charged for the transportation of a similar quantity under similar circumstances to a greater distance in the same direction, passed the Connecticut Senate last week by a large majority. It had previously passed the House.

Denver & Rio Grande.—The plan of reorganization, as submitted to the bondholders, provides for a general mortgage to the amount of \$30,000,000, under which shall be issued:

1. Series A bonds, \$10,000,000, at 6 per cent. interest from Jan. 1, 1886, to be issued to holders of present firsts and car-trust bonds. Interest on the old bonds to be paid up in cash.
2. Series B bonds, \$20,000,000, at 4½ per cent., 1886-89, and 5 per cent. thereafter, to be issued for present consolidated bonds. Income scrip is to be given in adjustment of difference in interest and debentures for overdue coupons.
3. Second-mortgage income (non-cumulative) debentures are to be issued to the amount of \$20,000,000, at 5 per cent., if earned, to be exchanged for present general mortgage bonds.

4. Creditors holding collateral are to exchange such collateral for corresponding new securities. Other floating debt creditors to receive debentures at such rate as may be agreed on.

5. Stockholders, by paying \$3 per share and by paying or subscribing an agreement to pay not exceeding \$4.50 per share additional (not over \$1.50 per share in any one year) on penalty of forfeiture of all rights in the stock and under the agreement, and by surrendering and transferring their stock to the committee to be appointed, shall become entitled to a transferable certificate of deposit (for the number of shares so deposited), referring to the agreement, and for every \$75 cash so paid under the agreement the stockholders shall receive \$100 in debentures. The Committee shall hold and vote on the stock, until interest shall have been paid on all debentures issued, at the maximum rate for any one year after the year in or during which the last installment shall have become payable, when on surrender of the certificates of deposit the stock shall be transferred to the party entitled thereto.

6. A committee of five shall be appointed, to whom reasonable compensation shall be paid, and to whom, under this plan, the securities shall be surrendered and transferred, and payments made, and who shall have all the requisite powers to execute the plan, either by foreclosure and the creation of a new company, or otherwise, as they may deem proper, to dispose of surplus securities and decide upon the application of the proceeds, and whose duty it shall be to see that the funds collected from the stockholders be applied to betterments and improvements on existing lines as required, and to no other purpose.

Des Moines, Osceola & Southern.—Last week the appointment of a receiver for this road by the Iowa Circuit Court was noted. On April 13, on application of the bond-

holders, the United States Circuit Court at Dubuque, Ia., also appointed a receiver. Mr. R. T. Wilson, of New York, who is largely interested in the Wisconsin, Iowa & Nebraska road, is the heaviest creditor of this line, and is said to have bought up most of the contractors' liens upon it. His object is probably to secure control and add it to the Wisconsin, Iowa & Nebraska line.

Duluth & Winnipeg.—Officers of this company state that arrangements can be made for its construction provided people along the line will raise \$500,000, and they are now asking for subscriptions from the counties along the line in Minnesota.

East Tennessee, Virginia & Georgia.—A dispatch from Atlanta, Ga., April 15, says: "Yesterday Judge Hammond, of the Superior Court, issued an order under which R. T. Dorsey resumed possession as receiver of the Georgia Division of the East Tennessee, Virginia & Georgia Railroad. He is in possession of Superintendent Fry's office, and is operating the road. Henry Fink, receiver under the Federal Court, has not been heard from here yet. It is supposed he will contest Dorsey's claims, and may present him for contempt."

Fremont, Elkhorn & Missouri Valley.—Tracklaying commenced April 6 on the extension of this road from Valentine, Neb., to the White River. The company intends to have the whole distance of 141 miles completed by Aug. 1 next.

Grand Trunk.—This company has issued a circular notifying its employees of a cut in wages, to take effect from March 1, of 5 per cent. on all salaries under \$600 and 10 per cent. on all over \$600 yearly. This has caused considerable excitement among the employees, although it was expected, and a protest has been sent to the General Manager from the shops at Portland and Montreal.

The company's statement for February and the two months ending Feb. 28 is as follows:

	February.	1884.	Inc. or Dec.	P. c.
Earnings	\$202,674	\$274,785	\$456,252	\$527,773
Expenses	180,354	204,284	366,537	409,970
Net earnings	\$22,320	\$70,501	\$69,715	\$117,803
Per c. of exps.	88.9	74.3	84.7	77.7

For the two months there was a decrease in gross earnings of \$71,521, or 13.5 per cent., with a decrease in expenses of \$23,433, or 5.7 per cent., the result being a decrease in net earnings of \$48,088, or 40.8 per cent. This was largely due to the very severe winter and the long blockade of the line by snow in February.

For the two months ending Feb. 28 the earnings of the controlled lines west of Detroit were:

	Chi & G. T.	1884.	Inc. or Dec.	P. c.
Earnings	\$26,355	\$30,002	\$30,870	\$34,308
Expenses	78,881	81,305	27,139	30,368
Net earnings	\$7,474	\$11,697	\$3,740	\$4,030
Per cent. of expenses	91.3	87.4	87.8	88.3

The Chicago & Grand Trunk shows a decrease in gross earnings of \$6,647, or 7.2 per cent., and in net earnings of \$4,223, or 36.1 per cent. The gross earnings of the Detroit, Grand Haven & Milwaukee decreased \$3,519, or 10.2 per cent., and there was also a decrease of \$290, or 7.2 per cent., in net earnings.

Gulf, Colorado & Santa Fe.—Notice has been given of a special meeting to be held June 15, to vote on the question of issuing second-mortgage bonds to an amount not to exceed \$8,000 per mile, on the main track of the line, constructed or to be constructed, and on all its branches. The bonds to be dated April 1, 1885, and payable Oct. 1, 1923, with interest at 6 per cent.; the payment thereof to be secured by deed of trust and mortgage. The bonds and deeds of trust are to be in lieu of the second-mortgage bonds and trust deed which were authorized to be issued by the stockholders at a meeting on Aug. 1, 1883.

Houston & Texas Central.—A dispatch from Galveston, Tex., April 14, says: "An important suit, brought by the Farmers' Loan & Trust Co. of New York against the Houston & Texas Central Railway Co., is pending here in the United States Circuit Court. The plaintiff sues as Trustee of the mortgage executed by the Texas Central. The bill in equity alleges that the company's Trustee of the mortgage issued June 16, 1873, covering the Waco & Northwestern Division and also 6,000 acres of land per mile of completed road. This division is completed for a distance of 180 miles. This mortgage, therefore, embraces over 1,000,000 acres of fertile land. The plaintiff also sues upon a mortgage issued Oct. 1, 1872, covering the main line and Western Division and 3,840 acres of land per mile of completed road. The main line and Western Division are completed a distance of 456 miles. This mortgage, therefore, includes about 1,500,000 acres of land. The bill embraces another mortgage, covering the Waco & Northwestern Division, issued May 1, 1875, covering also 6,000 acres per mile of road completed. The fourth and last mortgage sued upon was executed April 1, 1881, and covers all the lands of the Texas Central Railway, including all town lots. This mortgage embraces the entire original grant of 10,240 acres of land per mile of completed road on all lines of the defendant company."

"The bill alleges that the company has defaulted in payment of coupon interest, and that it is insolvent. The plaintiffs ask for an accounting and that a receiver be appointed. This suit is distinct from that already brought against the company by the Southern Development Co., under which Receivers have already been appointed and are now acting."

Kansas City, Clinton & Springfield.—The grading on this road is now well advanced from Raymore, Mo., the junction with the old Pleasant Hill & De Soto road (which was purchased by this company) to Clinton, a distance of 49 miles. The bridges are nearly all in place. Tracklaying was begun at Raymore last week, and 5 miles are reported laid. Grading is in progress from Clinton southward, and also northward from Ash Grove, where the junction will be made with the Springfield line of the Kansas City, Fort Scott & Gulf. The right of way has already been secured from Clinton to Ash Grove and a number of contracts let for grading short sections.

Kansas & Gulf Short Line.—Regular trains on this road are now running to Alto, Tex., 57 miles southward from the northern terminus at Tyler, and train service will shortly be extended to Forest, 70 miles from Tyler. Track is laid about 7 miles beyond Forest, and the grading is nearly completed to Lufkin, 95 miles from Tyler, where connection will be made with the Houston, East & West Texas road. The completion of this road will give the road a connection with Houston, and will also, it is expected, give it a considerable lumber traffic. The section already built reaches into the lumber belt, and a number of mills have been established on the line. The purpose of the company is to build from Tyler northwest to Gainesville, about 150 miles, and work on the

section will be begun as soon as the line is completed to Lufkin.

Lake Erie & Western.—The litigation commenced by the holders of income bonds, and intended to prevent the consolidation of this company and the Lake Erie & Mississippi, has been further complicated by a suit in *quo warranto*, brought on behalf of the State of Illinois to determine by what authority the company is operating in Illinois. It is charged that it has not been legally incorporated under the state law, and that the consolidation by which the present Lake Erie & Western Co. was formed was not legally effected. Officers of the company claim that all this litigation is brought for the purpose of compelling the company to buy up the old income bonds, the holders of which brought the original suit.

The suit to enjoin the consolidation came up before the court at Bloomington, Ill., April 11, when the Court decided that there were no grounds for an injunction and dissolved the one temporarily granted. The adjourned meeting of the stockholders, to vote on this consideration, will be held as soon as possible.

Lake Michigan & Ohio River.—This company has filed articles of incorporation to build a railroad from Yeddo, Ind., southward to Jasper, about 120 miles. The line is intended to be an extension of the Chicago & Great Southern road. At Jasper it will connect with the Louisville, Evansville & St. Louis road.

Louisville, New Orleans & Texas.—The work of widening the cuts and ditching the road-bed on this line between Vicksburg and Baton Rouge has now been completed. The company will shortly begin the work of ballasting on their line from New Orleans to Memphis with gravel.

Mann Boudoir Car Co.—This company is pushing the use of its cars wherever possible, and has just closed a contract with the Boston & Lowell Co. for the use of those cars for all the summer business between Boston and the White Mountains. The cars are also to be put on the line between Boston and Montreal as soon as a sufficient number are ready for use.

Memphis, Selma & Brunswick.—Work is being pushed on the construction of this road from Memphis, Tenn., to Holly Springs, Miss., a distance of 46 miles. The old track laid several years ago from Holly Springs westward for 20 miles has been cleared up and put in order, and tracklaying has been completed on 12 miles of the new line. It is expected that the 14 miles remaining to reach Memphis will be completed early in June.

Mexican Railroad Notes.—Work on the road from Mazatlan to Rosario was begun March 19, under charge of Engineer Manuel Marin. The surveys of this line have been completed.

A contract is reported let for 100 kilometres of the Topolampam road; but local Mexican papers express serious doubts as to whether the line will exist elsewhere than on paper for some time to come.

The *Mexican Financier* says: "On March 21, 24 kilometers of the railroad between Campeche and Tenabo, Yucatan, were completed for operation."

"There has just been finished by the Mexican National Railway Co. a new iron bridge over the Salado River. It is a handsome and substantial structure, consisting of one span of 180 ft., two of 90 ft. and two of 33 ft. each. The river span rests on two heavy stone piers encased by iron caissons. One end of one of the 90-ft. spans is supported by iron cylinders filled by masonry. The other ends are on masonry abutments. This makes the fifth iron bridge now finished on the Monterey Division, and the masonry is up ready to receive one on the Saltillo Division."

Mississippi & Tennessee.—A report comes from Memphis that this road, a controlling interest in which is now held by the Louisville, New Orleans & Texas Co., has again been sold, the Illinois Central Co. having offered a considerable advance for the stock now held by the other company. The report is not confirmed by the officers of either company, although it is not denied that negotiations of some kind are in progress. The Illinois Central has threatened to extend its Yazoo City Branch to Memphis on a line most of which would be nearly parallel to the Mississippi & Tennessee, and it is possible that some arrangement for the joint use of the road may be in contemplation.

New York, Chicago & St. Louis.—It is reported that the representatives of the first mortgage bondholders are negotiating with the Lake Shore Co. for a settlement, and that the Lake Shore has offered to lease the road and guarantee 4 per cent. on the first mortgage bonds. This the committee is not willing to accept, believing that they ought to get at least 5 per cent. interest on the bonds. It is said that the committee will press this demand with the expectation that the Lake Shore will accede to it rather than permit a foreclosure, through which it would lose all the interest it owns in the road, and which might transfer the road into unfriendly hands.

New York & New England.—In the United States Circuit Court at Hartford, Conn., Messrs. William T. Hart, Frederick J. Kingsbury and Eustace C. Fitz, trustees under the second mortgage, have filed a cross-petition, praying for the partition of the rolling stock of the New England Car Trust, and for an order to close the trust. The petition represents that prior to Jan. 1, 1884, the American Loan & Trust Co., as trustee under the articles of association, creating the car trust, leased to the New York & New England the following property: 50 locomotives, 39 caboose cars, 18 passenger cars, 320 box freight cars, 4 express cars, 920 coal cars and 2 baggage cars, for which the trustee company issued 1,341 certificates, of the value of \$1,000 each, 100 of which were paid April 1, 1883, and the remainder were exchanged for rolling stock of the railroad company. The petition further represents that Receiver Clark, alleging that the continued custody of the whole of their rolling stock is a burden to the estate in his hands, threatens to deliver to the owner—the American Loan & Trust Co., trustee—and in this case it would be withdrawn from the railroad; but in the opinion of the petitioners the use of a portion of it has added and will continue to add to the earning power of the railroad, and if all of it is withdrawn the earnings of the road will be materially diminished; they therefore pray for a division of it. The time for hearing this petition has not yet been fixed by the Court. Of this rolling stock, 31 locomotives and 200 box freight cars are in disuse.

On April 6, the last day, there had been \$600,000 of the New England Car Trust bonds deposited with the American Loan & Trust Co., to be exchanged for second-mortgage bonds of the New York & New England. There were \$300,000 more ready for exchange, and said to be nearly \$300,000 more likely to come in.

April 8, the Connecticut Senate passed the bill for settling the overdue taxes of the New York & New England road, by accepting \$150,000. It has already passed the House.

New York, New Haven & Hartford.—The work of ballasting the Springfield & New Haven Division with stone, which was last season completed as far as Windsor Locks, Conn., has been resumed between Windsor Locks and Springfield, and will be continued through the tunnel.

New York, West Shore & Buffalo.—A meeting of bondholders was held in New York, April 13, under a call issued by persons opposed to the plan of reorganization. It was largely attended and there was much excited discussion. An attempt was made by the counsel for the trustees to explain their action, but it was hardly listened to. Finally resolutions were adopted providing for the appointment of a committee of seven to prosecute the foreclosure suit to a conclusion and prepare a plan of reorganization. The committee was also instructed to resist the issue of any more receiver's certificates. It was impossible to state what amount of bonds was represented or voted for the adoption of this resolution. The committee appointed consists of Messrs. John A. Stewart, W. W. Osborn, Charles R. Flint, Russell Sage, Henry Clews, T. B. Musgrave and S. S. Sands.

North Conway & Mount Kearsarge.—This company was organized at a meeting held in North Conway, N. H., April 10, for the purpose of building a railroad from that place to the summit of Mount Kearsarge. The road is to be a narrow-gauge line. The capital stock of the company is fixed at \$400,000, of which a considerable amount was subscribed at the meeting.

Northern (New Hampshire).—The directors of this company claim that the charges made in the amended bill in the Dow suit are founded and are made in the interest of the Concord Co. to prevent, if possible, the ratification of the lease of the road by the Legislature. They claim that their management has been careful, and that they have much increased the value of the property, and deny all charges of appropriating the company's funds to their own use. They say that there is no speculation whatever with the company's funds, and no illegal loans of any kind.

Oregon & California.—The Receiver reports that the gross earnings of this road from Jan. 20, when he took charge, to Feb. 28, were \$111,568. The operating expenses were \$83,269; leaving the net earning \$28,299.

Oregonian.—In accordance with the application of the bondholders, the United States Circuit Court has appointed a Receiver for this road, who has already taken possession and will operate the road pending the trial of the appeal made to the United States Supreme Court against the decision of the Circuit Court, declaring the lease of the road to the Oregon Railway and Navigation Co. to be valid.

Oregon Railway & Navigation Co.—The Executive Committee has decided to recommend to the board the declaration that the usual dividend be paid, but on account of the loss of earnings, owing to the blockade of the road in February, to advance the date of payment one month, making the dividend for four months instead of three.

Pacific Mail Steamship Co.—At the annual meeting in New York April 16, Mr. Gould offered a resolution to the effect that the Central and Union Pacific railroads be requested to transfer to the Pacific Mail the business—but not the steamers—now carried on by the Occidental & Oriental Steamship Co., plying between San Francisco and the Chinese and Japanese ports, and execute a contract with the steamship company guaranteeing it for 10 years, as far as possible, from opposition. As an offset, the Pacific Mail will engage to become a member of the Transcontinental Association in the same manner as if it were a railroad between the Atlantic and Pacific, the percentage to be awarded the steamship company to be arbitrated by a board composed of one member appointed by the Pacific Mail and a second to be appointed by the Commissioner of the Transcontinental Pool. This resolution was adopted without dissent, and is said to be acceptable to the Union Pacific management.

After the close of the meeting, President J. B. Houston said that while no positive agreement had been reached, he thought the arrangement as above would eventually be made, and that an informal agreement had substantially been arrived at whereby the present contract between the railroads and steamship company for a guarantee of \$95,000 per month would be extended until June 1, in order to give proper time for the arrangement of details.

Pennsylvania.—Work on the extension of the new Schuylkill Valley line from Reading to Pottsville is to be pushed forward. Contracts were to be let this week for a considerable portion of the grading and for the bridge which will cross the Schuylkill River at Hamburg.

Philadelphia & Reading.—In the United States Court in Philadelphia, April 10, arguments were heard on the Master's report in favor of authorizing the Receivers to make payments due under the New Jersey Central lease. Counsel for the Bartol Committee asked the Court for an order, which was granted, as follows:

"That the Receivers be and they are hereby authorized to make payments out of the revenues derived from the operations of the road referred to in said lease of the Central Railroad Co. of New Jersey, in payment of obligations arising under said lease to the extent only of the net revenue derived from the operation of said road."

Some further argument followed, in which counsel for the Receiver claimed that the Central road was essential to the profitable management of the Reading. The Court finally said that whatever was on hand now should be applied to the overdue debts of the Central, but the judge added that he did not think the lease would be profitable unless modified. While he saw no objection to the earnings of the road being applied to payments of its liabilities, he would not allow anything to be taken from the earnings of the Reading for the purpose of paying outside debts.

The Receivers have decided, under the order of the Court, to make the Central payments by remitting to the officers of that company the net earnings of the road as fast as received. Under this arrangement it is thought that the overdue coupons on the first-mortgage bonds can be paid before long.

Pittsburgh & Western.—The United States Circuit Court has authorized the Receiver to borrow \$210,000 to pay pressing claims, and has directed him to issue certificates to that amount.

Portland & Ogdensburg.—The Receiver of this road represents to the Court that he has expended \$229,000 for permanent repairs and improvements of the road, and he petitions the Court for leave to pay coupons on the first-mortgage bonds and other claims against the road; and also for leave to sell \$50,000 of certificates which were authorized some time ago, but not then sold. The Court stated that if the parties in interest presented no objection, these petitions will be granted.

The Boston Herald says: "One important result of the absorption of the St. Johnsbury & Lake Champlain road into the Boston & Lowell system has not yet been brought out. This relates to the future of the Portland & Ogdensburg. The line through the White Mountain Notch was constructed for the purpose of giving Portland an independent route to the West. Down to 1880 the present St. Johnsbury & Lake Champlain was known as the Vermont Division of the Portland & Ogdensburg. Since its reorganization in the year just named, it has continued to work in entire harmony with the Portland & Ogdensburg proper. Beginning at the west end of the connected line, the St. Johnsbury & Lake Champlain has extended from Maquam Bay to Lunenburg (the

latter place being on the Connecticut River, 22 miles east of St. Johnsbury), and the Portland & Ogdensburg has covered the space between Lunenburg and Portland. But from Scott's, three miles east of Lunenburg, to Fabyan's—the White Mountain centre—the Portland & Ogdensburg has used 20 miles of the track of the Boston, Concord & Montreal Division of the Boston & Lowell, paying therefore \$6,000 a year. A charter is in existence for the construction of a parallel road over this distance of 20 miles by the Portland & Ogdensburg, but with the existing arrangement in operation this has not been necessary. Now the Maine Legislature, at its recent session, passed an act under which it is expected that the Portland & Ogdensburg will be taken out of the Receiver's hands and subjected to a friendly reorganization. A new corporation, in other words, is to be formed by the bondholders. By the same statute, moreover, a lease or sale of the property is authorized. A few years ago the Canadian Pacific Co. negotiated unsuccessfully for a lease of the Portland & Ogdensburg, and the people of Portland, who are chiefly interested, have anticipated fresh offers from one party or another. They have depended upon the maintenance of the St. Johnsbury & Lake Champlain, at all events, for a western outlet and inlet for their line. It has also been rather expected that after the reorganization the missing 20 miles between Fabyan's and Scott's would be supplied. But the transfer of the Vermont extension to the Boston & Lowell interest leaves the Portland & Ogdensburg a mere local road from Portland to Fabyan's without a western connection except the Lowell, with no motive to build from Fabyan's to Scott's, and with three miles of track between Scott's and Lunenburg, at a distance of 20 miles from the rest of its line, connecting only with the Lowell road's White Mountain Division on one hand and its Lake Champlain Division on the other. This three miles of track is thus utterly useless to the Portland and Ogdensburg, while the Lowell needs it to join its new acquisition to the White Mountain system. Under the circumstances, therefore, the Lowell road can probably buy the bit of track very cheap. If it cannot buy, it will of course build, as there is no existing immediate connection between the St. Johnsbury & Lake Champlain and the Boston, Concord & Montreal.

"The situation being as here outlined, the end of the Portland & Ogdensburg will naturally be its absorption by either the Boston & Maine or the Boston & Lowell. The former needs it as an extension of its Conway Division from North Conway through the Notch to Fabyan's; the Boston & Lowell, controlling it, would be absolutely without a competitor in the White Mountain region, except the Grand Trunk on the north and east side of the Presidential range. The Portland & Ogdensburg could probably be operated by either one of these great corporations to better advantage than it will be independently as a local road only 91 miles long."

Reading & Chesapeake.—At a recent meeting of the stockholders of this projected road it was decided to make an effort to secure the construction of the line. Engineers have been put at work on the survey from Reading, Pa., to Carpenter's Point, on Chesapeake Bay, below the mouth of the Susquehanna. Most of the line was surveyed several years ago. It is intended also to survey a branch from Holland to Lancaster, and a connection with the Pennsylvania Schuylkill Valley road near Reading.

Richmond & Danville.—This company is considering the question of building a new passenger station in Atlanta, Ga., to be used by its own road, the Georgia Pacific and the East Tennessee, Virginia & Georgia.

St. Johnsbury & Lake Champlain.—By the resignation of a number of the old directors and the election in their place of gentlemen connected with the Boston & Lowell, this company has passed completely under the control of the Boston & Lowell Co., and will hereafter be operated as a part of that company's system.

Savannah, Florida & Western.—Preparations, it is stated, have already been begun on this road and the Charleston & Savannah for a change of gauge from 5 ft. to 4 ft. 8½ in. The time for making the change is not yet decided, and probably depends somewhat upon the connecting line from Charleston to Wilmington. The Atlantic Coast line is now 4 ft. 8½ in. gauge as far south as Wilmington, and the proposed change will extend the standard gauge through to Jacksonville, Fla.

Shenandoah Valley.—The Court has authorized the Receiver to borrow \$300,000 for the purpose of paying overdue wages and other pressing floating debt claims. Certificates will be issued to the amount named.

Southern Pacific.—The Southern Pacific Co., which has recently leased the Southern Pacific and the Central Pacific lines, was organized under a charter obtained in the state of Kentucky. Not long ago a similar charter, and under the same name, was obtained under the laws of Connecticut. It is now stated that the Southern Pacific Co. organized in Connecticut has changed its name to the Newport News & Mississippi Valley Co. This change of name would seem to indicate a purpose to unite the Huntington road between Newport News and New Orleans under one organization, as has already been done with the lines west of New Orleans.

A dispatch from Washington, April 14, says: "The representatives of the Southern Pacific Railroad Co. have given notice of a desire to contest the recent order of Commissioner Sparks, of the Land Office, throwing open to settlement as part of the forfeited Texas & Pacific land grant about 500,000 acres of land at the point where the land grants of the Texas & Pacific and the Southern Pacific line overlap, and which is claimed by the Southern Pacific Co. as part of their land grant. As the Commissioner did not show a disposition to hear argument on the subject, the attorney for the railroad company intimated that an appeal would be taken to Secretary Lamar."

Later dispatches say that the Georgia Court subsequently withdrew its order, and appointed a hearing for April 18 on the question of putting its receiver in possession.

Texas Central.—In a suit begun by Morgan's Louisiana & Texas Co., to recover \$762,000, the United States Circuit Court has appointed receivers for this road. The receivers are Messrs. B. G. Clark and Charles Dillingham, who are also receivers of the Houston & Texas Central. The Texas Central Co. owns a line from Ross, Tex., to Albany, 178 miles, and another line from Garrett to Roberts, 52 miles. The road is controlled by the Houston & Texas Central Co., and it has always been operated in connection with that line, but there is no lease or contract between the companies, and its earnings have not been reported.

Western & Atlantic.—It has been reported that this company was preparing for a change in the gauge from 5 ft. to 4 ft. 8½ in. An official statement, however, is that no immediate change is contemplated, although all new work is done and all new locomotives and cars built with the view to making the change hereafter. The lease of the road, however, has only 5 years to run, and it is not probable that the lessees would incur the heavy expense of a change under present circumstances. If the gauge of the Louisville & Nashville and the Cincinnati Southern roads is changed the Western & Atlantic will probably follow, and the change on those lines is pretty sure to be made within a year or two.